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# NATIONAL BUILDER



JANUARY 1915

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A MICHIGAN  
RESIDENCE.  
JENS. C. PETERSEN,  
ARCHITECT.

COMPLETE WORKING PLANS  
ARE SHOWN IN SUPPLEMENT  
FOR THIS MONTH —

A DETAILED ESTIMATE  
APPEARS ON PAGE 35.



# The Little Builder

## Concrete & Mortar Mixer.....

### "BALL BEARING"

No job is too small to handle at a profit and very few too large for the *LITTLE BUILDER*. It is a mixer you can hardly afford to be without. Jobs which you have previously sub-let or mixed by hand can now be done with your own men much quicker, with no delays, and the profits go into your own pocket that heretofore went to others. Use it for your floors, steps, foundations, drives, form work—anything in the concrete line. *It is also a good mortar mixer.*

The ease with which it can be handled and moved around from job to job makes it most convenient for building operations, and the low price places it within every builder's means. It should be a part of your building outfit. It costs only a few cents a day to operate, and saves two to four men. It will pay for itself in a week's time.

**\$165.00**

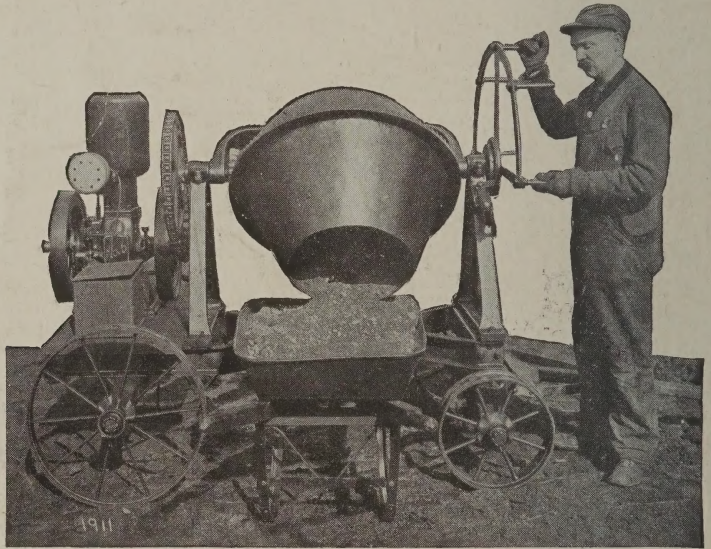
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**\$265.00**

**With Power Loader**

**\$30.00**

**For Hoisting Attachment**



## Lansing Concrete Mixers

### The Little Builder

is an easy mixer to operate because the shoveling height is just right. Men are less tired at the end of the day than in two hours hand mixing. Power loaders if desired. The mixer is loaded on one side and discharged on the other and the gravel is never in the way of the wheelbarrows. The mixing is always in sight, which means a uniform, quick mix. It is easy to clean and gives a good mix. A high class, powerful 2 to 2½ H. P. engine is furnished—the best finished engine of the size ever built—strong, sturdy and plenty of power.

It is strong and durable, made of iron and steel throughout with few parts to wear out. Being ball bearing it requires little power and can be oper-

ated with one or more men. High wheels for easy hauling; ball and socket for rough roads and short turns; 4-inch steel channel frame; steel wheels; steel axels, etc.

Can be furnished with hoisting attachment for raising lumber, lath, brick, etc. The engine can be taken off quickly and used for other purposes if desired.

*Send for the circular today*

### Write for Concrete Machinery Catalog

We also manufacture larger power mixers, hand mixers, block machines, brick machines, cap and sill moulds, wheelbarrows, mortar trays, hods—everything in the builders line. Write for catalog.

*Specify just what you are interested in*

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# THE NATIONAL BUILDER

Vol. 57 (51st Year) Chicago, January, 1915 No. 1



The Stair Hall in a Traverse City Home. Jens C. Petersen, Architect.

## NATIONAL BUILDER DESIGN No. 390.

Jens C. Petersen, Architect, Traverse City, Mich.

For Floor Plans, Sections, Details and Full Working Drawings, see Supplement of this month. Estimated Cost \$5,594.24.\*

## Estimate of a Suburban Home

I. P. Hicks

EXCAVATING AND MASONRY			Cement sills for cellar win-	
270 yds. excavating at 35c.....\$	94.50		dows .....	12.00
1,868 cu. ft. concrete wall, 25c...	467.00	1,050 ft. cement floor in cellar, 9c.		95.40
965 cu. ft. face wall above grade,				
40c .....	386.00	Total excavating and ma-		
38 lin. ft. stone chimney, \$3..	114.00	sonry .....	\$1,206.50	
37 lin. ft. brick chimney, 80c..	29.60	LUMBER BILL		
Cement caps for chimneys.	4.00			FEET
Cement caps for steps.....	4.00	1 8x 8x16 ft. posts .....		64
		8 2x12x18 ft. girders .....		288
		46 2x10x16 ft. first floor joists.....		1,242

\*Materials are figured at Omaha prices. Carpen-  
ter labor figured at 50 cents per hour.



12 2x10x18 ft. first floor joists....	360
15 2x10x12 ft. first floor joists....	300
46 2x10x16 ft. second floor joists..	1,242
12 2x10x18 ft. second floor joists..	360
14 2x10x12 ft. second floor joists..	280
22 2x 8x14 ft. second floor joists..	418
24 2x 8x16 ft. attic joists.....	504
14 2x 8x20 ft. attic joists.....	378
26 2x10x16 ft. sills .....	702
16 2x 4x16 ft. sills .....	176
17 2x 8x10 ft. front porch.....	230
18 2x 8x12 ft. front porch.....	288
8 2x 8x16 ft. rear porch.....	168
24 2x 4x12 ft. porch .....	192
24 2x 4x14 ft. rafters .....	216
324 2x 4x10 ft. outside studding...	2,140
140 2x 4x10 ft. first story partitions.	933
160 2x 4x10 ft. second story parti- tions .....	1,066
12 2x 6x10 ft. partitions .....	120
50 2x 4x16 ft. plates .....	550
65 2x 4x12 ft. plates .....	520
30 2x 4x16 ft. dormers .....	330
14 2x 4x20 ft. rafters .....	182
14 2x 4x18 ft. rafters .....	168
40 2x 4x16 ft. rafters .....	440
20 2x 4x12 ft. rafters .....	160
16 2x 4x12 ft. collar beams.....	128
30 1x 6x12 ft. braces .....	180
20 2x 4x12 ft. lookouts .....	160
24 1x 4x12 ft. bridging .....	96

Total feet dimension.....14,501

14,581 ft. dimension lumber, \$27..\$	423.68
3,750 ft. 8-in. No. 2 lap, outside sheathing, \$27 .....	101.25
2,800 ft. 8-in. No. 2 lap for rough floors, \$27 .....	75.60
1,550 ft. 2 1/4 face clear flooring, second story, \$45.....	69.75
1,650 ft. 2 1/4 face clear maple flooring, first floor, \$65..	107.25
2,900 ft. 1x6 No. 2 sheathing roofs, \$26 .....	75.40
28,000 clear shingles, \$4.....	112.00
11,000 clear shingles for second story outside walls, \$4... ..	44.00
1,500 ft. 1 1/2x4-in. siding, \$30....	45.00
10 rolls tarred felt paper, \$1.	10.00
440 ft. 1x4x10 ft. flooring for front porch, \$45.....	19.80
70 ft. 1x4x12 ft. flooring, rear porch, \$45 .....	3.15
440 ft. 5/8x4x10 ft. ceiling for porch, \$30 .....	13.20
70 ft. 5/8x4x12 ft. ceiling, rear porch, \$30 .....	2.10

1,000 ft. 5/8x4x12 to 16 ft. ceil- ing, cornice, \$30.....	30.00
15 1 x 6x16 ft. finish, \$45..	5.40
22 1 x10x16 ft. finish, \$45..	13.50
12 1 x12x16 ft. finish, \$45..	8.64
6 1 x 8x16 ft. finish, \$45..	2.88
6 1 1/8x12x12 ft. finish, \$50..	4.50
34 1 x 4x16 ft. finish, \$45..	8.15
2 2 x12x10 ft. cypress fin- ish, \$50 .....	2.00
2 2 x12x12 ft. cypress fin- ish, \$50 .....	2.40

Total lumber bill.....\$1,179.65

## MILL WORK

7 cellar window frames, 10x18, 3 lt., \$1.75.....\$	12.25
1 cellar window frame, 10x18, 2 lt. ....	1.75
7 cellar sash, 10x18, 3 lt., \$1...	7.00
1 cellar sash, 10x18, 2 lt.....	.80
3 cellar door frames, 2 ft. 8 in. x 6 ft. 8 in., \$2.25.....	6.75
3 cellar doors, 2 ft. 8 in. x 6 ft. 8 in. x 1 3/8, \$2.50.....	7.50
10 porch columns, 9 in. x 5 ft. 6 in., \$3 .....	30.00
2 porch columns, 6 in. x 6 in. x 7 ft., \$1.50.....	3.00
3 porch newels, 5 in. x 5 in. x 4 ft., 60c .....	1.80
24 ft. porch rail, bottom, 12 ft. length, 6c .....	1.44
24 ft. porch rail, top, 12 ft. length, 6c .....	1.44
96 balusters, 7/8x7/8x18 in., 2c...	1.92
60 balusters, 7/8x7/8x30 in., 4c...	2.40
500 ft. 3 1/2-in. crown mold, 2c....	10.00
500 ft. 1 1/2-in. bed mold, 3/4c.....	3.75
490 ft. 2-in. watertable, 1c.....	4.90
100 ft. 7/8 cove mold, 1/2c.....	.50
80 ft. 7/8 quarter round, 1/2c....	.40
1 front door frame, 3 ft. x 6 ft. 8 in. x 1 3/4, with side lights, 16x32, with transom, 32x8	9.00
1 vestibule frame, 3 ft. x 6 ft. 8 in. x 1 3/4, with side lights and transom, same as above	7.00
2 window frames, 20x20, 2 lt., \$2 .....	4.00
2 window frames, 36x28, 2 lt., \$2.40 .....	4.80
1 mullion sash frame, 4 sash, 16x40 .....	7.00
3 twin dormer frames, 18x16, 2 lt., \$4 .....	12.00





The Dining Room.

4 window frames, 40x28, 2 lt., \$2.50 .....	10.00	4 windows, 40x28, 2 lt., \$7.30..	29.20
2 window frames, 44x32, 2 lt., \$2.50 .....	5.00	2 windows, 44x32, 2 lt., \$10....	20.00
1 window frame, 40x32, 2 lt., \$2.50 .....	2.50	1 window, 40x32, 2 lt.....	9.00
2 window frames, 20x28, 2 lt., \$2.25 .....	4.50	1 window, 20x28, 2 lt.....	2.68
2 window frames, 24x20, 2 lt., \$2.25 .....	4.50	1 window, 20x28, top sash divided .....	3.68
2 window frames, 30x28, 2 lt., \$2.35 .....	4.70	2 windows, 24x20, 2 lt., \$2.56..	5.12
4 window frames, 24x26, 2 lt., \$2.25 .....	9.00	2 windows, 30x28, 2 lt., \$3.....	6.00
1 triple frame, 36x32, center, 2 lt., sides, 20x32, 2 lt.....	7.00	4 windows, 24x26, 2 lt., \$2.90..	11.60
1 sash frame, 20x18, 1 lt.....	1.50	1 window, 36x32, 2 lt.....	7.00
1 twin sash frame, 28x40.....	3.50	2 windows, 20x32, 2 lt., \$3.....	6.00
4 windows, 16x32, side lights, top sash divided, \$5.....	20.00	1 sash, 20x18, 1 lt.....	1.75
2 windows, 20x20, 2 lt., \$2.36..	4.72	2 sash, 28x40, 1 lt., \$2.50.....	5.00
1 window, 36x28, 2 lt.....	6.24	1 set door jambs, slide door, 5 ft. 6 in. x 6 ft. 8 in., oak...	1.80
1 window, 36x28, top sash divided .....	7.50	1 set door jambs, 2 ft. 8 in. x 6 ft., oak.....	.90
4 sash, 16x40, 1 lt., \$1.50.....	6.00	1 set door jambs, 2 ft. 8 in. x 6 ft. 8 in., Y. P.....	.70
2 windows, 18x16, top sash divided, \$2.90 .....	5.80	2 colonnade openings, oak, \$35.	70.00
4 windows, 18x16, 2 lt., \$2.10..	8.40	1 set door jambs, 2 ft. 8 in. x 6 ft. 6 in., ash.....	.80
		11 set door jambs, 2 ft. 6 in. x 6 ft. 6 in., ash, 70c.....	7.70
		1 cased opening, ash.....	1.20
		1 front door, 3 ft. x 6 ft. 8 in. x 1 3/4, oak .....	18.00





The Hall and Library.

1 vestibule door, 3 ft. x 6 ft. 8 in. x 1 $\frac{3}{4}$ , oak.....	17.00	250 ft. oak base, 5c.....	12.50
2 doors, 2 ft. 8 in. x 6 ft. 8 in. x 1 $\frac{3}{4}$ , oak, \$8.....	16.00	250 ft. oak base mold, 1 $\frac{1}{2}$ c.....	3.75
1 door, 2 ft. 8 in. x 6 ft. x 1 $\frac{3}{4}$ , oak.....	7.50	250 ft. oak floor mold, $\frac{3}{4}$ c.....	1.87
1 door, 3 ft. x 7 ft. x 1 $\frac{3}{4}$ , pine.....	5.00	24 plinth blocks, 6c.....	1.44
1 door, 2 ft. 8 in. x 6 ft. 8 in. x 1 $\frac{3}{4}$ , pine.....	4.50	176 ft. casing, 14 ft. length, 2c...	3.52
1 cased opening, ash.....	3.00	48 ft. casings, 12 ft. length, 2c..	.96
11 doors, 2 ft. 6 in. x 6 ft. 6 in. x 1 $\frac{3}{8}$ , \$3.50.....	38.50	32 ft. casings, 16 ft. length, 2c..	.64
24 oak plinth blocks, 8c.....	1.92	68 ft. head casing, 2c.....	1.36
168 ft. oak casing, 7 ft. for doors, 4c.....	6.72	68 ft. cap mold, 2c.....	1.36
216 ft. oak casing, 6 ft. for windows, 4c.....	8.64	16 ft. window stool, 2c.....	.32
160 ft. oak head casing, 4c.....	6.40	16 ft. apron, 2c.....	.32
160 ft. oak cap mold, 3c.....	4.80	56 ft. window stop, $\frac{1}{2}$ c.....	.28
120 ft. oak door stop, 14 ft. length, 1c.....	1.20	124 ft. door stop, 1c.....	1.24
252 ft. oak window stop, 14 ft. length, $\frac{3}{4}$ c.....	1.26	138 ft. base, 3 $\frac{1}{2}$ c.....	4.83
80 ft. oak window stool, 12 ft. length, 3c.....	2.40	138 ft. base mold, 1c.....	1.38
80 ft. oak apron, 12 ft. length, 3c.....	2.40	138 ft. floor mold, $\frac{1}{2}$ c.....	.69
230 ft. oak picture mold, 3c.....	6.90	48 ash plinth blocks, 7c.....	3.36
62 ft. oak plate rail, 10c.....	6.20	288 ft. ash casings, 12 ft. length, 3c.....	8.64
		156 ft. ash casings, windows, 12 ft., 3c.....	4.68
		172 ft. ash head casing, 3c.....	5.16
		172 ft. ash cap mold, 3c.....	5.16
		216 ft. ash door stops, 1c.....	2.16
		168 ft. ash window stops, $\frac{3}{4}$ c.....	1.26
		60 ft. ash window stool, 3c.....	1.80
		60 ft. ash apron, 2 $\frac{1}{2}$ c.....	1.50
		440 ft. ash base, 4c.....	17.60



440 ft. ash base mold, 1½c.....	6.60
440 ft. ash floor mold, 1c.....	4.40
250 ft. ash picture mold, 1½c...	3.75
Front stairs, oak.....	45.00
Cellar stairs, Y. P.....	12.00
Cases in pantry.....	25.00
Bins in pantry.....	9.00
230 ft. oak panel strips, 3c.....	6.90
460 ft. oak cove, 1½c.....	2.30

Total mill work.....\$ 818.06

#### CARPENTER LABOR

14,581 ft. framing lumber, \$10...\$	145.81
9,450 ft. sheathing, \$10.....	94.50
28,000 shingles on roof, \$2.....	56.00
11,000 shingles on side walls, \$2.50	27.50
1,500 ft. siding, \$1.50.....	22.50
3,200 ft. flooring, \$2.....	64.00
Smoothing same.....	40.00
2,000 ft. porch floors, ceilings and cornice plancier, \$15	30.00
Outside base.....	3.20

500 lin. ft. cornice work, 10c..	50.00
Setting frames.....	12.00
Porch steps.....	8.00
45 per cent cost of mill work for finishing.....	368.13

Total carpenter labor ..\$ 921.64

#### RECAPITULATION

Excavating and masonry.....	\$1,206.50
Lumber bill.....	1,179.65
Mill work.....	818.06
Carpenter labor.....	921.64
Hardware and nails.....	80.00
Tin work.....	64.00
Plastering, 1,100 yards, 28c.....	308.00
Plumbing.....	320.00
Electric wiring.....	60.00
Painting.....	210.00
Heating, furnace.....	160.00
Incidentals, 5 per cent.....	266.39

Total estimate.....\$5,594.24

## How To Use This Estimate

This estimate is figured at Omaha prices, with carpenter labor at 50 cents an hour. To use this estimate for other localities the reader will note that the price of each grade of lumber, as well as all other materials, is given in the regular trade units, that is per thousand feet for lumber, per thousand for shingles, per cubic yard for excavating, etc.

It is a simple matter to substitute the prices current in your vicinity for the

prices given in this estimate and to extend the quantities and so determine the exact cost for your neighborhood.

For instance, framing lumber may be \$30 per thousand in your town while it is figured in this estimate at \$27. Simply extend the number of feet at \$30; labor may be more or less. The owner may want to contract for the furnace or plumbing separately. The detailed estimate makes these changes possible.

## A Home For Every Climate

**D**URING the past few years a considerable change has come over the design of homes throughout the entire country. The several sections, East, Central, West, North and South, each had their particular type of architecture, apparently indigenous to that neighborhood and seemingly impossible of transplanting to any of the other sections.

The Colonial house, typical of New England, with its characteristic simplicity, seemed adapted to the disposition of the people. Refinement and dignity appeared in every line. A quaint mixture of reserve, and yet majesty, has made it a type with the people, and it has been widely

copied, everywhere making a satisfactory home.

A little further South we find the old Southern mansion, built "before the war" and varying from the Colonial in the manner of hospitality. With practically unlimited numbers of servants, a new condition was met in the plan, and we find the wide porches, balconies, larger and numerous rooms with high ceilings. It would tax the patience of modern women, as well as bankrupt the householder, to keep up the old-time plantation houses now, and yet the good features are preserved in what might be called the modern American style.

In the North, that is, in the district of



the Great Lakes, the tendency has been toward a home economical in space. Parlors, halls, stair room, balconies, etc., are largely dispensed with, making the entire space available for living purposes for the greater part of the entire day. It is here that the parlor, as such, began to lose its prominence, and a sort of combination of reception hall, parlor, sitting room, back parlor, library, and even the dining room, took its place. This is essentially the plan of the bungalow as originally designed.

#### THE HOME OF THE BUNGALOW

It is a long jump from the Central States to the Pacific Coast, but once made an entirely new condition appears before us. It has been met by a unique consideration, both of the climate and the desire for a comfortable home. Essentially it is the logical development of an Easterner brought up in the South, spending some time making money in the Great Central States, and in his declining years, seeking comfort in an equable climate. The good points of every locality have been incorporated, having in view refinement, hospitality, convenience and comfort.

The Bungalow is not a local proposition by any means. It has much to recommend it, and its good features appeal to many. It possesses a unique appearance and often gains favor for its looks alone. The Bungalow effect put on almost any plan attracts attention.

It must not be assumed that the Bungalow is confined to one-story buildings. The effect is often produced in full two stories and here is just where the architect may display his greatest talent.

Wide as the interest in the Bungalow appears, the fact remains that a well designed building always attracts attention. In every locality the plan or elevation is slightly altered to suit each individual condition. A sleeping porch skillfully arranged appeals just as much to the Canadian as to the native of Mississippi. A dignified Colonial mansion brings inquiries, not so much from Massachusetts as from Texas.

#### EDUCATION OF THE PEOPLE

We can only ascribe this similarity of taste to a general education of the people. Plan after plan is published in this and other magazines, and few are so rash as to attempt to plan a home without studying

the plans of numerous homes, East, West, North and South. The South needs refrigerators almost the year round, the North for six months only. Both install them, and both realize their need. Basements, for a long time were uncommon in the South, but now they are the rule rather than the exception. That is one thing the South is copying from the North.

On the other hand, sleeping porches are merely an adaptation of the wide Southern casement windows and doors. Screens and awnings are copied too, as a refuge against warm weather inconveniences.

#### HEATING—NORTH AND SOUTH

With unlimited fuel the South managed to keep from freezing to death with the old-fashioned fireplace. No one pretended the houses were comfortable in the winter months, at least as a Northerner understands comfort. It merely tided one over the cool season. Now, however, the South, and the West too, appreciate the value of a little heat just when and where needed, and they are adopting the Northern stove and furnace for heating the homes of today.

Only a few years ago, winter was dreaded almost as much in the South as in the North, except that the North *knew* it was going to be cold for some months while the South *hoped* it would not be cold for more than a few days at a time. But when the thermometer gets to 30 degrees or even 40 degrees some heat and protection is necessary, and these temperatures are by no means uncommon over 90 per cent of the whole United States. On the other hand, every section feels a temperature of 90 to 100 degrees for a longer or shorter period. *Both extremes* must be provided for by at least 75 per cent of the entire country, and herein lies the community of interests which binds the whole country, in a construction sense.

The American style of architecture therefore provides year round comfort for every climate. Just as we provide fire insurance, although it would be a hundred years before we are touched, so every section protects itself from what may come. What affects the East also affects the West. The wind blows in both places. Cold and heat penetrate all sections. It is not surprising homes are built alike. It would be surprising if they were built otherwise.



## WHAT INFLUENCES DESIGN?

Many minds from many countries have influenced the use of materials for *appearance*, both exterior and interior. This is only natural. Customs with which one is familiar influence the arrangement of the rooms somewhat, but the essential requirements remain the same. Natural conditions are reflected in the construction. Thus from the first cause we have the appearance, from the second the plan, and from the third, the hidden values which add to the comfort in protection against the elements. Disregard for any of these is disastrous, as we frequently see in an Italian villa on a barren hillside, or Swiss chalets on a narrow level lot, in the closed rooms of a house too large for the family, and in a house so poorly constructed that wind blows through, the roof leaks, and all sorts of squeaky noises caused by lack of bracing, too weak joists, etc.

The first is a matter of taste, the second is governed largely by the family and its social position, and the third is dependent almost entirely by the *extremes* of the weather conditions. In the warmer districts one could, if necessary, put up with the relatively few cool days, but these few days will make a greater impression on the memory than the many pleasant days. Why not in building provide against them? In the colder climates we could worry through the warm nights without screens and the storm sash on. But we don't do it. In both sections we are providing for the extremes.

The architecture, as far as the exterior is concerned, may be left to the wishes of the owner. He knows what he wants in the matter of *appearance*. The versatility of the average architect allows him to adapt almost any plan to the accepted lines of the style of any country or period.

The plan is becoming more homelike, from a broad interchange of ideas in planning, from the study of many plans, and from visits to both old and new homes. Competitions, in which members of draftsmen give their expression of the solution of a definite problem, show the great variety of plans which will meet a given condition or price. Variations to suit individual cases are possible in most plans without interfering with the general plan.

An unoccupied space or room is *not* copied, it is merely noted as a thing to be *avoided* in the next plan. An impractical plan betrays itself even on paper and far more when built. For instance, towers were once thought an evidence of gentility. How many are built now? Not serving any good use they are omitted, and the cost placed where the investment will mean added comfort.

The construction of the home, while more complicated than formerly is really becoming more standardized. The details are becoming more uniform, due to millwork, doors, etc., being purchased in quantities.

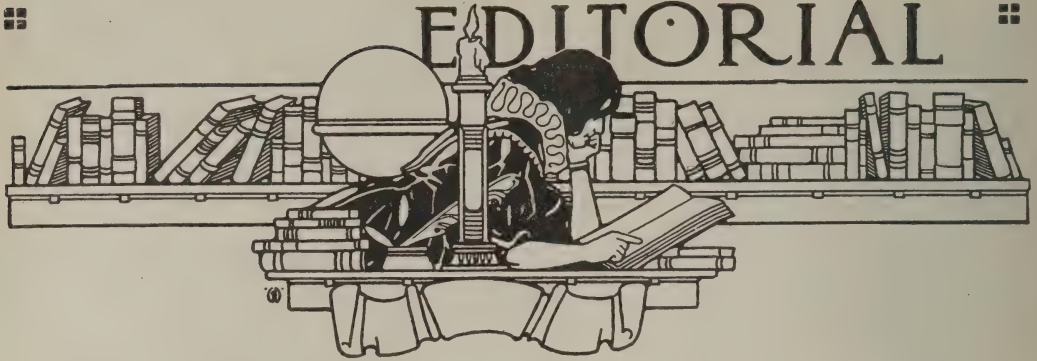
Homes, whether in city or country are provided with all modern conveniences. Bathrooms are always on the plan, hot and cold water, gas, electric light. Rip Van Winkle today would be unable to locate himself, for from East to West, from the Lakes to the Gulf, we are nearing one general style of architecture, in design of exterior, in plan, in construction and in equipment.

## THE IDEAL HOME

While the ideal home means something different to each individual, whether as owner or architect, there is much in every well planned home which may well be considered when planning another. In the home shown this month on our supplement sheet and in the interiors on these pages, the architect has combined the owners personal requirements with the accepted standards of good taste. The home *was* built in Traverse City, Michigan, but in general plan it is as adaptable to California or New Hampshire, Florida or Dakota. Provided, of course, that the social and financial position of the owner will warrant a home of this size. The exterior is as satisfactory as the plan and is readily adaptable to almost any style of landscape gardening. It will be as satisfactory in the country as in the suburbs or in the city. It will require a fifty-foot lot at least, but there are few places where this is not possible.

The entire plan will stand careful study from the standpoint of any section. Do we require only a little heat? The fireplace in the living room will provide it. A similar fireplace in one of the bedrooms can be appreciated best by those who have wintered in the South.





"A stitch in time saves nine," was Poor Richard's homely advice and has no better application than when practiced on a building—new or old—but more particularly if referring to a leaky roof or a defective water pipe.

\* \* \*

Immediate attention to these little matters, will not only "save nine," but in many cases may save the whole structure. Old Ben Franklin knew the value of "striking while the iron was hot," his homely, but wise sayings, were the result of good, practical common sense, and were the fore-runners of many of our modern saws. "Do it now" is a modification of our first saying.

\* \* \*

"Never put off until tomorrow, whatever should be done today." This is another homely, but valuable admonition, and on the same lines as those good old copybook texts, when we were told that "delays were dangerous," and that "procrastination is the thief of time." These are all good precepts, and are of more importance to the operative mechanic than to most people. Sharpen and fix up your tools now, don't let a job overtake you because of your not being ready for it!

\* \* \*

There is a movement in certain circles to establish a system of quantity taking, by men adequate for the purpose, and whose figures and estimates will be in a measure dependable for correctness. This is the method usually adopted in most European countries, and after being employed for a great many years has been found to be the best method yet devised for obtaining cost of buildings of all

kinds. Men are trained for the purpose, and in some countries undergo a rigid examination before they are permitted to practice, and they must take out a license with the number of their certificate attached, which is a guarantee they have had the necessary training, and therefore, are supposed to be well fitted for the purpose. This system for having quantities taken is not only a great convenience to contractors, but a great help to owners, as the costs given them are so nearly correct that they may be depended upon, and it cuts off the usually dreaded "extras" that so often become factors of importance in the furnishing of contracts.

\* \* \*

We have often wondered why the system of employing quantity-takers was not adopted more freely here. True, many Architects and Contractors employ their own men for the purpose, but this does not always work satisfactorily. The writer has often been employed for the purpose, and made many hundreds of dollars, but, as the work was not regular or continuous he worked under many disadvantages, such as not having catalogues up to date and properly classified, no reliable memos of the shifting of wages, raising and lowering of prices of materials, railroad charges, market fluctuations, many other things that will occur to the reader. A man in this business who intends to follow it should have a well stocked office, with abundant shelves for catalogues, notes of cost of all sorts of odd work and other matters pertaining to his business. He should be well equipped with all sorts of current Architectural books, and particularly those dealing with estimating or



with building materials of any kind. He should also know all about the building laws of the state, and the municipalities, the prices for excavating, earth moving, and dumping rules, and labor customs. Fany other things that will suggest themselves to the experienced reader. Architects *may* make mistakes, but a quantity-surveyor *must not*, this is imperative—the errors of the former may be adjusted on paper, but when the figures of the latter are once accepted, and the contract signed, the agreement is as fixed as the laws of the Medes and Persians, and any change made in them must be mutual and may be the cause of much inconvenience, trouble and loss.

The introduction of the quantity surveyor in the building trade of this country, would insure much more uniformity in the prices of work tendered for, and the owner or owners would more likely get full value for what they pay, than under the old system. The cost figuring would not be left to incompetents, or to persons whose duty seems to be to make the owner pay for every doubt—and a big price at that. Guess work would be eliminated from the figures. I have found in my experience that young women trained to some extent in figuring on quantities and cost of labor and materials in buildings, are often much more clever and keener than men and as their knowledge extends their efforts increase in value.

\* \* \*

Who is to pay the cost of this new factor in figuring? As a set off, it might be asked, who pays the bill under the existing method? The owner, of course, pays for one estimate in every case, for it is usual for estimators to charge up the cost of the work of estimating, and the price is sometimes very high. We have known it as high as 3½ per cent on the bulk. It is no hardship for the owner to pay for the estimate, for in return he gets reliable figures of his expected outlay, and his contractor gets exact quantities of the materials he will be expected to supply to complete the work. From these he can figure the cost, and thereby be in a position to figure closely. Sometimes the wide awake builder may be able to buy a little better than the market rates, in bricks, stone, lumber, hardware, glass, etc., and

this will permit him to cut down his tender to the warming point.

\* \* \*

An idea gathers no moss unless it is set to work and put into practice at once. If you fail to put this good idea into execution you can't help feeling dissatisfied with yourself, especially when you see, too late, that in buying you have made mistakes that a little intelligent advertisement reading would have prevented. To keep yourself informed by means of such papers as THE NATIONAL BUILDER is the best idea for practical purchasing. The value of a Manufactured Product is not created by the claims of its maker but by its merit. You may be sure that a product advertised regularly in a trade journal must prove its value by measuring up to its advertised merits. A poor article cannot stand the light of steady advertising. Buy the products that are good enough to be advertised. Watch THE NATIONAL BUILDER and follow its advice when buying unless you have intelligent opinions of your own, which you should respect, and you cannot go far astray.

\* \* \*

The Annual Convention of the National Association of Builders Exchanges will be held in Columbus, Ohio, January 26, 27, 28, 1915. Those who attended the last Convention at Louisville, will doubtless be present to renew the acquaintances made there, to listen to the reports of action on the resolutions adopted at that time and to learn first hand the several new features which the Association will urge action upon for the coming year.

The month of January was chosen for the Convention largely because building is not quite as active at that time and Columbus holds the Convention through the fact that it has an active Builders Exchange.

Our readers will no doubt remember the account of the last Convention in our March number, and we are sure that the coming Convention will be equally interesting and instructive to those who attend.

These Conventions show the importance of Builders Exchanges and their value to the individual members. The time is near when the city without an active Exchange will be considered lacking in one of the most important features of progress.





The Completed House and the Boys Who Built It.

# Training Carpenters For the Trade

*James F. Johnson, Director, State Trade Education Shop, Bridgeport, Conn.*

ALL over the country today much is being said about the decline of the old apprenticeship, where the contractor used to work along side of his apprentices and give them personal helps in the points of their trade or coached them on at spare times in some branch that needed bracing up. It is true that conditions today have become rather specialized, and competition has become so keen that the great need for the contractor to make all the money possible on the job, allows little or no time to be given the so-called apprentice. The boy is no longer the old style of apprentice, but is now more of a helper. Little thought seems to be given to the fact that these same uncared-for helpers are gradually getting into the trade and will some day pose even as carpenters. In all the rush not much attention seems to have been given to the future supply of competent help,—

for a carpenter must be more than a man handy with tools, he must have intelligence.

Nevertheless, the great throng of unskilled workers continues to grow, and the future of the skilled trades looks appalling when given serious consideration in this present light.

The solution of building up these conditions in the trades and industries is found in the German schools. The fact that Germany is the world's industrial leader is because the workers in the trades are skilled, and have been educated and trained for their work by a system of industrial and trade school which required compulsory attendance throughout the length of their apprenticeship in the trade. They have actually conserved the necessary energy so as to apply it in the development of the trades and the industries into which they go.





A View in the Parlor Showing the Colonnade and Stairs.

#### THE CONSERVATION OF LABOR

For years we have heard a great deal and read even more about the great problem of conservation. But in a seemingly blind way little has been said or done toward conserving the greatest waste of all. Each year there is emptied out of our public school systems, hundreds of thousands of boys and girls under the age of 16 in search of a living wage. Being absolutely void of any working knowledge, they drift into most anything that brings them a few dollars, and as a rule, there they stick, each year furnishing admirable recruits who will later be enlisted in that great floating army of the unemployed. The results of this lack are evident in any of our trades today,—and here lies material for the greatest problem in the conservation of the nation's resources, for if these young people could at least be directed, if not prepared, their energy in building up the nation's bulwark of industry would not be so wasted.

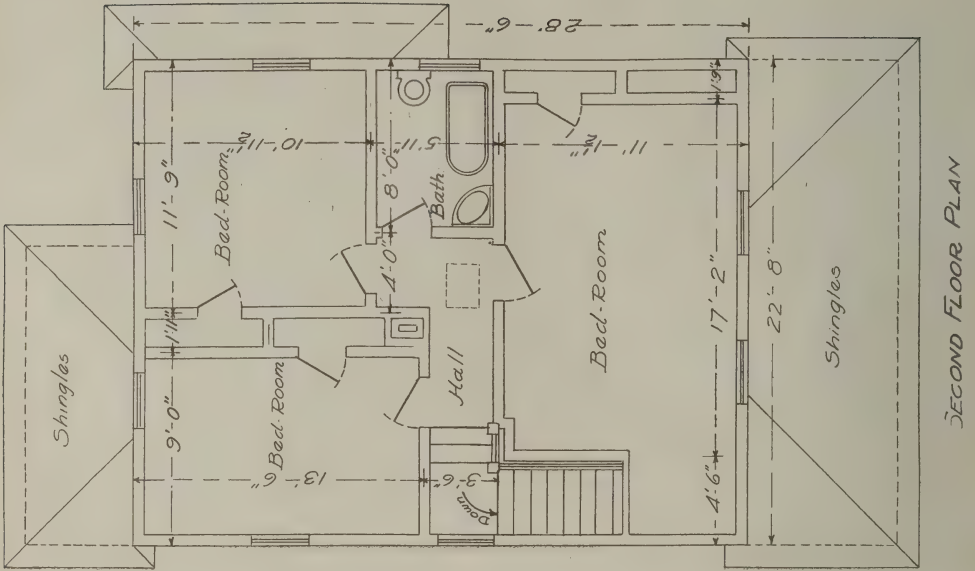
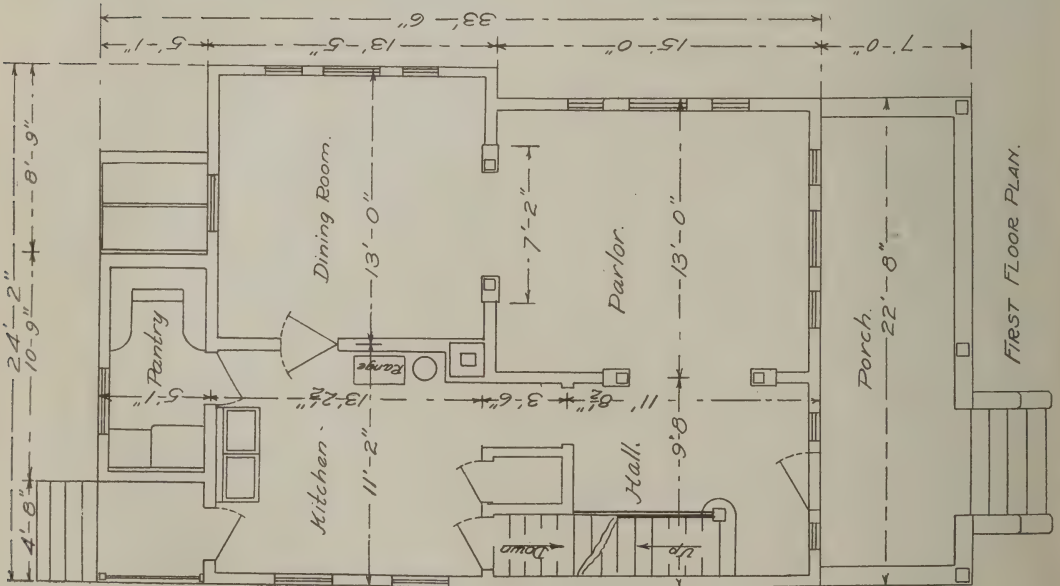
This is the great problem with which the national commission on industrial education at Washington is wrestling, and

with which many cities throughout the country have been wrestling for the past few years.

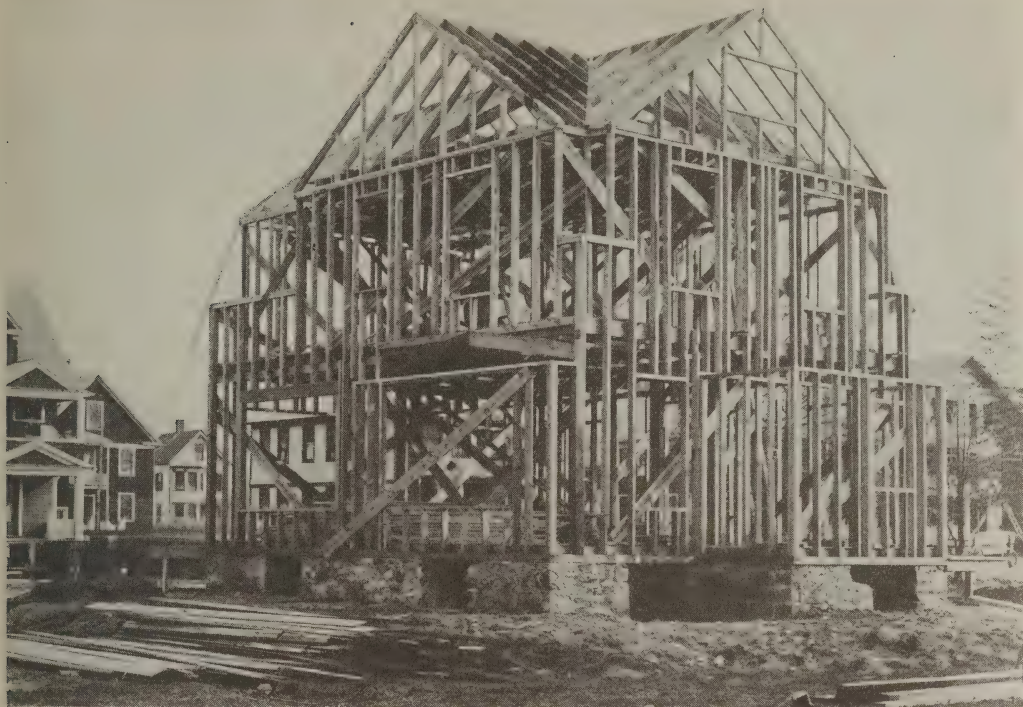
#### THE CONNECTICUT PLAN

The state of Connecticut seems to have progressed the farthest in the solution of this problem. It has realized the lackings of present day educational methods, and having taken time by the forelock, is endeavoring to prepare for their future working lives the young people who constitute part of the many thousands who leave school under 16 years of age. Through an enactment by the legislature the state has provided a system of trade instruction for boys and girls between the ages of 14 and 16. Inasmuch as these young people cannot enter an apprenticeship until 16 years of age, they are actually saving these two years of their lives, while at the same time preparing themselves so that at the age of 16, when they may enter the trade, they can do so with some preparation, when they are of value to themselves and their employers and where their understanding of trade conditions has an upbuilding effect upon the craft.









A View When the Framing Was About Complete.

These trade schools controlled by the state are located at Putnam, New Britain and Bridgeport. The purpose of all three is identical and the general organization is the same. They have been formed for the purpose of making complete the general educational system of the state, by preparing for their future those young boys and young girls who leave school before they are eligible to enter a trade. This preparation for future working life consists of trade instruction combined with the general education related to it.

#### THE BRIDGEPORT SCHOOL

The trade school at Bridgeport, which is a part of this great organization, has been running for the past few years and at this date has graduated some fifty apprentices. These young men and young women have all entered the trades and their success and progress are definite assurances of the correctness in the methods of instruction employed.

The trades taught are printing, linotype operating, machine work and toolmaking, drafting, plumbing and sheet metal work, carpentry, cabinet-making, patternmak-

ing, sewing, dressmaking, costume design and millinery. The length of the apprenticeship is 4,800 hours of satisfactory work. As all boys and girls are not fitted for the work they select, a probation period is granted during which time they are especially supervised.

The entire school is a shop, and the schoolish atmosphere is lost. Each department is an individual shop, and the instruction in that trade centers around practical work of a trade value. As a result first class instruction is given upon the same line of work that will later be followed and it is given under the exact conditions of the trade. Each instructor as well as being a teacher has the first requisites, being a thorough tradesman. Being instructed over such a length of time upon real live trade work it can well be seen how these young people are quite well equipped for their future work. Besides his trade instruction the apprentice receives a general education related to his trade and so essential for a more complete understanding of it.

No doubt, the methods of instruction





Stair Builders at Work in the Shop.

adopted by the carpentry department for properly instructing its apprentices have attracted most attention. In reality the carpentry shop is the exact duplicate of the up-to-date carpenter shop outside, but equipped so as to accommodate fifteen workmen.

#### WINTER WORK

During the winter months these young men are instructed in the actual practices of their trade by doing repair work or remodelling work, interior woodworking and general jobbing work, all of such a nature as to furnish the best material for a thorough instruction. When spring comes these young apprentices get away from the shop and build a house, and this work they have successfully done for the past three years. As a result, the carpentry trade has been supplied with young men equipped with first class carpentry experience, young men full of active life who are intelligent workers, who can read plans and understand a drawing, and can use their heads when it comes their turn. Without such an institution these people might never have gone beyond the stage

of a mill operative, and even if they had, would of necessity have depended upon the trade to educate them as best it could, which as we all must acknowledge is not much beyond a very small portion of what is necessary.

#### TAKEN UNDER CONTRACT

As a regular part of their trade instruction these apprentices of the carpentry shop of the Bridgeport Trade School this year built their third trade school house. And as the photograph shows, it is a dandy. This house, which was built for a local contractor under the same conditions as it would be handled by a builder, is a six room cottage with a gambrel style of roof and from the plans it can be clearly seen how well arranged was the general exterior.

The work on the house extended over the summer months into September, and at all times the job was a real live serious business affair with the young carpenters. The rough flooring on the first floor was laid as the frame work was being erected. On this house the roofing problem was somewhat different than previously and



View from the Dining Room Through Parlor and Hall to Front Door.

because of this a new feature was furnished the older apprentices who had worked upon the house built last year. To these boys fell the laying out of the roof. The accompanying photograph shows how well this was accomplished.

The shingling problem was also a new one, as on this house the roof was covered with the Reynold asphalt shingle. During the process of this work the job was regularly inspected by many carpenters and builders as this was the first time that this asphalt shingle had been used in Bridgeport.

The interior work was carried on by both the cabinet makers and the carpenters. Each group of boys was assigned a room to trim out, the older ones getting the rooms down stairs where the most difficult problems were to be met.

Between the living room and dining room and the hall are two arches of simple but effective design, worked out and constructed by the older apprentices. These

are made of selected ash and are of such pleasing lines as to lend a quality to their surroundings. A photograph through the living room to the hall may show one of these arches to advantage.

#### STAIR PROBLEMS

The stair problem also was handled by the advanced apprentices with the assistance of the younger ones. These are of the same effective design to harmonize with their surroundings. They were built in the carpentry shop at the trade school and later carted to the house and put up. The risers are jointed into the treads and the spindles in turn are mortised into the treads, the whole job being constructed according to the best practices.

After the inside trim was about completed, the finished floor down stairs was laid. And after this was scraped and the general wood work put in shape for the painters the house was inspected, according to practice, by those interested car-



penters and builders who have an understanding of the work and the importance of the trade school. Their criticisms were of the highest praise and the whole job was pronounced excellent.

Trade School House No. 3, as this house is called, presented several problems that were food for thought, and even after the work was done, one might find an apprentice who was still thinking.

In connection with his trade instruction, the boy is taught to read blue prints and plans, and make shop drawings. He is also drilled thoroughly in that part of mathematics that relates especially to his trade. In each of these related technical studies the proposition of building the house furnished plenty of material both for drawing purposes and mathematics.

Regularly each day these young men had their trade arithmetic related to the work in hand. Their class room was the lumber pile, and saw horses served them as desks. Saturday morning was spent in the drafting room at the trade school building working over plans for the coming week's work or studying over those that had already been completed.

Through this medium of practical instruction the trade school at Bridgeport has chosen a most effective way of instructing young men properly for their trade. The apprentices who have served their time under this plan are taught according to the exact trade methods upon real up-to-date material, giving them first hand a thorough knowledge and a fitness for the work they will later do.

The results of all this are sure to have a remarkable effect upon the trades and conditions related to it, for there is being placed upon the market trained help who in their turn must do the thinking in their chosen line of work. By giving them this excellent foundation they will be able to cope with what is before them and instead of these being a dejected lot of would-be mechanics, a newer life will have been installed into the trade and it will grow



Shingling the Front.

and prosper. It means a better product, better working conditions, and above all a happier workman.

Where a building contract contemplated that in the work of excavation filled ground might be encountered, and specified the prices for excavating it, such excavation was not an alteration of the contract discharging the contractor's sureties.—Hiller v. Daman, 166 S. W. (Mo.) 869.



Some of the Boys Who Worked on the House.

# Shop and Field Equipment

EVERYONE connected with the building trades recognizes that skill with the hand and eye can best be utilized by a certain amount of machinery. This is the outcome of years of study, and is not merely an excuse to avoid doing work by hand. Quite the contrary. Suitable machinery varies from machines so simple as to almost be called tools to the complicated mechanism which almost uses brains in its operation.

Why is machinery necessary? Good work can be accomplished by hand, but it is well known that before the use of machinery there was very little uniformly good work done. The machine goods are an unvarying quality, the same today as yesterday and equally exact at 8 a. m. or 5 p. m. The human element is largely lacking, but a good workman must be ever standing over the machine to direct it and watch it.

Every contractor wants to make money, first, last and all the time. Some, not all, are in love with their work and take pride in it but all recognize that only by an economical output can any money be made. The machine turns out the work without much effort on the part of the workman, who can give his time to keeping the mechanism up to the point of highest efficiency. This means economy and a saving in expense. The saving means more profits.

There is always a good chance to make a good reputation on a job. Likewise there is a chance of losing it on the next unless the fullest advantage is taken of the available machinery. *Individual* reputations may be made by hand work, while the machine is more apt to bring credit to the shop as a whole, making the shop a favorite one for the better class of workmen. However skillful they may be with their hands, the machine will allow them to do their best and to do far more than they otherwise could. In this way they will get the benefit of the machine's work, in quantity, as well as their own in quality.

Time is a most important factor in all work and the carpenter or contractor who can do in less time a greater amount of good work than his neighbor, need not fear but that everyone will know all about it.

Quantity with quality is a most imposing feature to assist in making and keeping a good reputation. The contractor who delivers the goods, quantity, quality and on time will have his reputation to live up to.

A great deal of the work in modern buildings is now done in the "Mill," in other words, in the other fellow's "shop." Formerly, the carpenter and contractor had all of this to do. How did it get away from him? Why, the mill man got in the *machinery* to do the work. It is by equipping the small shop with suitable machinery that a large part of the work can be brought back. It will not only keep the contractor and his men busy, when otherwise they would be idle, but it will get the work out exactly as they want it, and *when*.

As far as *price* is concerned there may be a difference either way, but when all the circumstances are considered, there will almost always be excellent reasons for doing the work at home.

Some men, some contractors, are always dreading the hard times, the idle times which are apparently coming. Perhaps they are, perhaps they are already upon some of us, but the man with a well equipped shop has a place to go at least, and a place where, surrounded by the ingenious works of *others* he may plan how to use those works to his advantage. Some one will see him in his shop and think of something to be done. Having a place where he may keep busy all the time, and where he can be found when wanted, is not going to hurt the contractor one bit.

## WHO NEEDS MACHINERY?

It is difficult sometimes to figure out what some one else wants or needs, but in the case of machinery there is not a great deal of chance to go wrong. Everyone can use it to advantage. After getting his set of tools, the apprentice would do well to have a foot power scroll-saw for himself, with which he can make the hundred and one things he sees everyone needs. He can have a grinder to sharpen scissors and knives, and a *reputation* along this line will keep him too busy to think about cold weather. If he should he will get his own



skates good and sharp and after a few nights' practice, cut a few Dutch Rolls, Figure Eights, Grapevines, etc., and blame it all on his sharp skates.

The carpenter contractor probably is the most interested one in this subject. His work while largely hand work still has many places where cutting, trimming, boring, etc., is merely labor when done by hand, but requires some skill in knowing just how to do it before putting it in the machine. If he makes a specialty of any one thing, such as cabinet work, furniture, pattern making, etc., he will, being specialized himself, need the special machines and apparatus designed especially for his use and to make his work easier and more profitable. Each line has its special equipment, although some machines are adapted to a wide range of work.

#### THE SMALL CONTRACTOR

A beginner must feel his way in every line. Very few people ever get anywhere without persistent and continuous effort. We see occasional flashes of brilliant men, but we do not see the many hours, days, even years of hard preparation. The beginner, however bold, should be cautious, for there are as many pitfalls in contracting as in the stock market, and they are just as hard to avoid too. The small shop can well serve as the nucleus of a large and prosperous business, but it must in every case have a firm foundation of careful training and study. The small contractor, even more than the large contractor, must be careful in his selection of equipment, selecting only that actually needed, and not stocking up for several times his apparent business. There is no objection at all to his thinking he is going to have the largest business in his town, but until he has it *in sight* it is better to spend his time building the business up by degrees. The large contractor uses exactly the same machinery and equipment as the smallest contractor, but he has more of it. The small contractor can keep the larger one in view and work steadily ahead with the one purpose of being if not the largest next year, still a little larger and better than this.

The large contractor taking work not only in carpentry but also in masonry, plastering and general work, needs a larger shop and more equipment. Not only larger

in size but more varied in its general character. He will find he must supply not only the money and brains, but even the machinery and equipment for many of his subcontractors. Just how far he goes with this depends on the general character of his contracts, but it is safe to say that nothing pays him better than his shop and equipment; without it neither he nor his subs could get the job in the first place, nor complete it in the second place.

#### WHAT IS NEEDED

Skill in the use of hand tools is really more necessary with machines than without them. Unless a man can do the work of the machine, he cannot be expected to guide the unthinking mechanism. The intelligent use of machinery improves the quality and greatly increased the quantity, but an ignorant workman can spoil more in an hour than a capable man would in a lifetime. There is danger too with the unskilled, not only to himself, but to the machine, the product, the mill and the other employees.

The equipment must bear a rational relation to the work turned out. For instance, there is little economy in having an elaborate bandsaw to do a few feet of sawing once or twice a year. A small scroll saw could probably do the same work, and additional work besides. On the contrary it is poor economy to worry along with inefficient machinery rather than replace it with that better fitted to the work in hand. Each shop has its popular line of work, and while others can be added and built up, there is little economy in going after "something-to-fill-in-the-time." An active, aggressive campaign to get work and build up profitable lines, will pay every time, provided the shop is equipped to turn out the work, and the contractor and his men understand the work to be done.

#### FOR THE SMALL SHOP

The contractor, as before intimated, should gauge his shop expenditures by the work in hand, in prospect, or in contemplation. That under way will give him an excellent insight into his requirements, and the first job he completes will probably make him resolve to be better fitted for the next. If he does a small jobbing business, with such small contracts as readily fall his way, the excellent line of hand and foot

power machinery available will be of interest to him. A combination "saw-table" worked by hand or foot power, will cut up any small material about as fast as he wants to use it, while the absence of engines, switches, meters, shafting, etc., will save him concern as well as outlay for equipment and maintenance. The saw-table is generally arranged to use take attachments such as boring devices, cutter heads, grinders, etc., and is almost a miniature planing mill in itself. As his work calls for it, he can add such machines or attachments as a scroll saw, mortising machine, tenoner, lathe, etc. He may outgrow these, but if he does not, he has just what is necessary for his work. He knows too, that none of his men will leave the machines running at night, or even in the day time, when not in use. Of course, when the time comes, he can get a gas or electric motor to work one or more of the machines and thus be in line for more and heavier work. He will be able perhaps to work a few side lines, such as picture frames, mouldings, patterns, toys, novelties, etc., as well as the conventional building work, frames, sash, doors, screens, etc.

#### THE LARGER SHOP

As soon as we decide to equip the shop with power, unlimited possibilities are before us. Possibilities not only for doing work, but for spending money as well as making it. When one has nothing it is easy to imagine what one could do with a shop, or with money or even with sufficient credit. But it takes work to make good with any of them, and the safest way is to earn the money before you spend it. You will then know just what each machine has cost you not only in dollars, but in hours of labor. You will be better fitted to judge its value too, and see whether it will do enough work to justify its purchase.

As with the small shop, the larger one should be a development along natural lines rather than an attempt to suddenly equip a large business with all the tools and equipment of the trade. The size and shape of the shop has a good deal to do with the equipment too, for unless one has used judgment in building it, there will be a waste of space, of time, money and materials. It should not be too big or open for that means expense for heat during the

winter, as well as light during dark days or evenings.

The arrangement is a matter of taste, and will generally work itself out all right if all the machines are kept busy any considerable part of the time. As soon as one machine is found to be idle, and in the way, it will be shifted, and as soon as a bench or rack passes its days of usefulness it should go too.

#### THE COMBINATION MACHINE

The one machine which every jobber aspires to own is really a combination of several machines mounted on one base. A number of these machines in several sizes are available and they possess certain unquestioned advantages over simpler machines as well as more elaborate ones mounted on separate bases. Some of these are practically a whole planing mill, being capable of doing practically any of the work done in the average mill. Some are arranged to allow several men to work without interference, at one time, and on different kinds of work.

Most of the machines of this character are operated by their own power either by a gasoline or electric motor, others are intended to be connected to shafting operated by a centralized motor. Some are substantially built and intended for shop use only, while others are designed to stand moving from place to place on the job, and from job to job, without derangement of its mechanism. Which one or which size to buy is a matter for the individual, having *his* particular conditions in mind.

The rest of the shop equipment will be largely selected by bearing in mind the work to be done. A large amount of heavy framing might require a cut-off saw. Special machines are made for making sash, others for frames, screens, etc. It is often well to separate the machines, to allow freer use of each, as well as for better light and more storage space. When about the same class of work is done constantly, the machines should be placed to have the material follow the most direct route, without turning or carrying back too much. Shop trucks are handy, but they should not be overworked, that is, the material should not be carried all over the shop. The layout of the shop thus offers a field for active



thought, and the re-laying will also be a good thing.

Just take a look through the ordinary shops in your vicinity. Do they reflect well on the owner? Well, hardly. Cobwebs and dust, shavings and rubbish. Then to one the "shop" is a storehouse for old bobsleighs that never will be used again. A good job is to clean up and see what can be disposed of. It will surprise you to see what you will find. Possibly tools checked off as lost. Well, they were. Odds and ends of material, some of it fine lumber, well seasoned, and good for all sorts of things. Some only good to make into toys for the children. A firstclass shop will clean this material all out at frequent intervals. It will make room for good material and possibly a much needed machine.

#### THE CONTRACTOR'S YARD

Just outside the side door of the shop is the contractor's storage yard. Perhaps it is in good shape, but the chances are there is room for a clean up there too. Everyone hates to throw away scaffold plank, even if they have outlived their usefulness, and are a menace to anyone using them. Then there is usually a lot of "short-lengths" of everything from lath to heavy girders. Something left over from every job is thrown into a general scrap pile, which is never approached except to add to it. The scrap pile will stand a good sorting.

But there is even more there. Piles of mortar boxes and tubs, ladders, cement buckets and tools, shovels perhaps. The contractor needs all of these and they should be kept in order, for no owner likes to see a contractor fixing up his equipment after the contract is signed.

A corner of the shop could well be given over to the storage of small tools, machinery and equipment such as floor scrapers, shovels, hoes, saw horses, etc., thus keeping them in order and ready for instant use. Tool chests must be cared for also.

#### THE CONTRACTOR'S EQUIPMENT

Even the small jobs need some equipment. Frame houses need scaffold brackets, which may now be had in a number of styles, in both metal and wood, some fold into small space and so a large number can be readily stored or carried to the job. Stone or brick buildings require a derrick to lift the heavy pieces, sills, lintels, etc.,

On a factory job it comes in mighty handy too, to lift heavy posts, girders, frames, etc. The men do far more work when they are relieved of the heavy straining, pulling and lifting.

Too much care can not be taken with the equipment on the job. Every scaffold bracket should be inspected and tested before any men are trusted on it. Men are careless to the point of recklessness at times, while at other times they are exceedingly cautious. They certainly can do better and more work when they have plenty of good scaffolding and when they feel perfectly safe.

Lack of equipment often means the loss of a contract or a loss on it. Capital is wisely invested in the equipment for doing the work right.

#### TRANSPORTATION

To get materials and equipment to the job is a little more necessary than doing the work, for it must be done first. While some depend on a local drayman or get some material man to help them out, the really enterprising contractor is independent of them all and has his own trucks, whether auto or horse drawn. Several jobs at once will make a motorcycle pay for itself, and one or two country jobs, silos or dairy barns such as we featured last month will almost compel a contractor to have a light motor truck to take him and his men to and from the job every day.

#### ON THE JOB

Some of the shop machines are designed to be taken on the job. Some contractors would rather keep their shop intact and have other machines just for the job. Sometimes it is even necessary to have several machines of the same general character, such as sawtables, derricks, etc., when two or more jobs are going ahead at once. It is a good plan to have different sizes, for while two can be put on one job, the next time the building is enough larger to warrant the use of a larger machine.

#### POWER

Not only must a contractor do his work right, but he must do it on time. The gasoline engine is probably the greatest labor saver of modern times. A twist of the wrist and away it goes, turning the many wheels untiringly. Most machines

have them direct connected, while in others the engine can be moved to run any one of the several, or in a line shaft to which all are connected. For the shop, electric motors are frequently available, but the gasoline motor is probably more flexible and can be more readily adapted to varying conditions. The current also is not always obtainable on the job, while the engine can be supplied anywhere. The engine frequently suffers from lack of care, or even actual abuse, which would put any self-respecting electric motor out of business for all time.

We have tried to call the readers atten-

tion to some of the things he must consider regarding the machinery and equipment of his shop and his jobs. We have only touched on many of them and there are unnumerable others, some of which have been taken up in previous numbers of this magazine, while others must be reserved for future consideration. The small shop used only occasionally can be excellently fitted up with hand or foot power machinery.

No man wants to admit there is anything in his time he cannot do. Machinery is necessary to do much of it however, and unless he has it he is in trouble right away.

# Architectural Drawing Lessons

## Twentieth Paper

THE way to draw a correct Abacus is shown at Figure 130. Draw  $CD$  and  $EF$  at right angles to one another; bisect the angles in the center by the line  $GH$

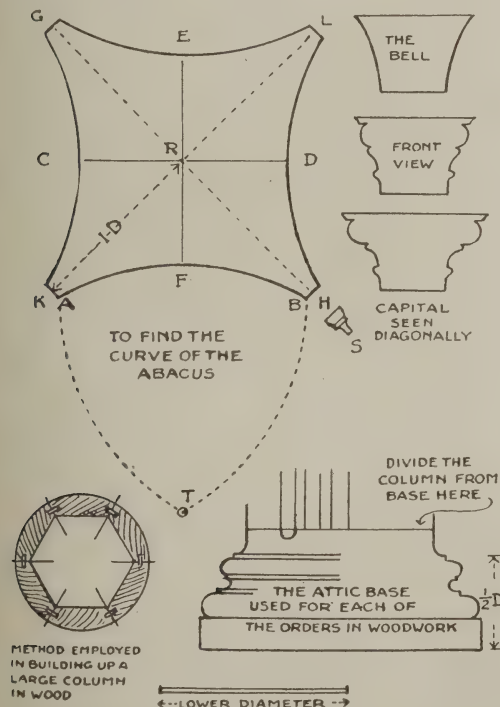


Figure 139.

and  $KL$ . From the center  $R$  measure off one diameter on each of the diagonals, and the points obtained will give the extremities of the abacus. Cut off the corners at  $KGL$

and distance  $AR$ , describe the arc  $BT$ , and with center  $B$  and distance  $BA$  describe the arc  $AT$ . Let these two arcs meet in  $T$  and and  $H$ , being careful to allow sufficient width for the moulding, which diminishes towards the bottom. Then with center  $A$

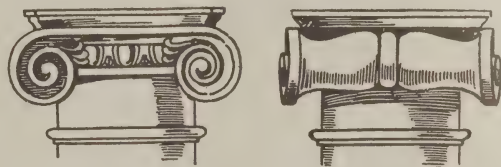


Figure 140.

with center  $T$  and the same radius describe the arc  $AB$ . This gives one side of the abacus. Proceed to draw the curves on the other sides by the same method.

The small sketches in the top right hand corner of the cut, if studied, will serve to prevent a mistake which is frequently made in laying out the work. The draftsman often omits to give a plan of the cap-

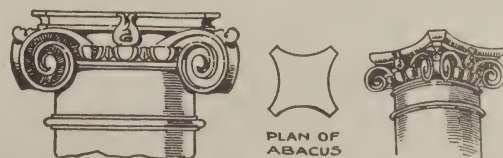


Figure 141.

ital and abacus, and the workman measures up the stuff required for the carved capital from the front elevation; but, as will be readily seen by measuring the drawing, the





distance G B (see plan of abacus) is considerably greater than the distance A B. The block of wood supplied for the capital is thus too small unless the diagonal dimensions is taken into account.

In joinery, columns are sometimes of considerable size, in which case they are built up as indicated in the bottom left hand corner of Figure 139, to prevent any possibility of splitting. To save material the base is turned out of a separate piece, the joint being made as indicated. The column is fluted before the base is fitted on, and when this has been done, the semi-circular finish is given by the carver. This method insures absolute accuracy. The necking mould just below the capital itself is turned on the shaft of the column. The base shown in Figure 139 is called the Attic base, and is used both for the Doric, Ionic and Corinthian orders in woodwork. It must be remembered that in some of the historic styles, notably in Jacobean and Elizabethan times, the orders, as used by the old workmen before they thoroughly understood the Renaissance detail, were very crude. The width of the Ionic capital, for instance, was sometimes out of all proportion to its height. Squat columns were used, and the entablatures and other details lost all sense of proportion. It is this quaintness and lack of nicety in proportion, coupled with a certain artistic sense, which lends to the early woodwork in this country its peculiar charm, and it is those variations which should, of course, be studied by the workman who is reproducing the work of that period. Then, again, there is considerable variation in the carved detail of the capitals at various periods in the Ionic and Corinthian orders. For instance, some of the Georgian designers developed a florid style of capital which differs very much from the precise detail found in the Louis Seize work at the Petit Trianon. But these,

after all, are questions of style, and the object of this article has been to set out, as clearly as possible, the main dimensions of the orders. All complicated measurements have been studiously avoided, and if the draftsman follows the simple rules enumerated above, he will escape the errors in proportions which are most frequently made.

The mouldings which are drawn in connection with the orders are merely suggestions and may, of course, be varied according to the individual taste. The classical column used in wood work and joinery is generally placed upon a square pedestal, which, like the different parts of the columns, should conform to certain definite proportions. The width of the pedestal itself, in all cases, is identical with the width of the base of the column. In our instructions for setting out the orders, we have given the projection of the base as a quarter of the lower diameter; but if this errs at all, the projection is rather too great than too little, and a fifth of the lower diameter may be taken if the designer so wishes. In this case, of course, the heights of the pedestals would remain about the same, but they would be contracted in width, making them appear rather taller and narrower.

The Doric pedestal is  $2\frac{1}{2} D$  in height, and the width is equal to that of the base of the column. Mark off  $1\frac{1}{2}$  diameters and follow dimensions as given in the example shown on Figure 142, where is shown the whole five orders as representing Roman classic architecture, with all the proportions written off. It will be noticed that the bases are all the same height, tho the various members vary in width and other dimensions. The other details speak for themselves. We would advise the student to practice on these examples often.

(To be continued)

In an action against the owner of property for the value of improvements made thereon, the defendant cannot be allowed damages on account of the plaintiff's refusal to complete the work, where such refusal was caused by his own repudiation of the terms of the contract regarding the price he was to pay.—*Draper v. Miller*, 140 P. (Kans.) 890.

Where the owner not only permits, but urges, the completion of a building contract after the time specified, and makes payments thereon, he is presumed to have waived strict compliance with the terms of the contract, and cannot claim damages for failure to complete within the time limited.—*American Radiator Company*, 105 N. E. (Ill.) 334.



# Trellises, Arbors, Etc.

*Chas. P. Rawson, Architect*

**T**REES AND SHRUBS help to make a house a part of the landscape and soften its harsh outlines, but vines are needed to complete the work and to give the finishing touch to the home. They give a charm that nothing else can supply. It is this abundance of vines on walls, arbors, trellises, etc., which makes the cottages of England so attractive. Vines may be used to cover unsightly walls and fences, screen porches, and beautify any unsightly part of the house. Hardy climbers will supply masses of fragrant and showy flowers of many colors and delightful perfume. There is no way to have an abundance of vines without something for them to cling to and grow upon. A few latticed trellises scattered about the house where there is a blank wall, at the side of a porch, or either side of an entrance, an arbor over the door or walk, or a pergola at the side of the house will furnish just what is necessary to convert many an ugly house into a thing of beauty.

These property entrancing additions to a bare building are rarely supplied when the house is built and when considered as an "extra" they are not thought necessary. Usually, therefore, the only way to obtain them is to add them at some later date. They will make a delightful occupation for the man of the house during the odd hours of the winter and be ready for use in the spring. They are so simple in construction that any man who can use a saw and hammer can make them. The more elaborate pergolas, however, will require the services of a carpenter.

Figures 1 to 5, inclusive, show a few of the simple designs of trellises for use against walls or at sides of porches. Number 5 is for use in front of a wide low window. The upright pieces of Numbers 1, 3 and 5 are of 2x4-inch and all the balance of the slats and vertical pieces are of 1x2-inch or 1x3-inch strips. They should, of course, be dressed on all sides and be well nailed together.

Figures 6 and 7 show a trellis for use over a door or window. The uprights are 3x3-inch in size with 1x3-inch slats. The "beams" at the top are 2x6-inch and 2x4-

inch, respectively. It would be necessary to have the curved 3x3-inch pieces made at a mill.

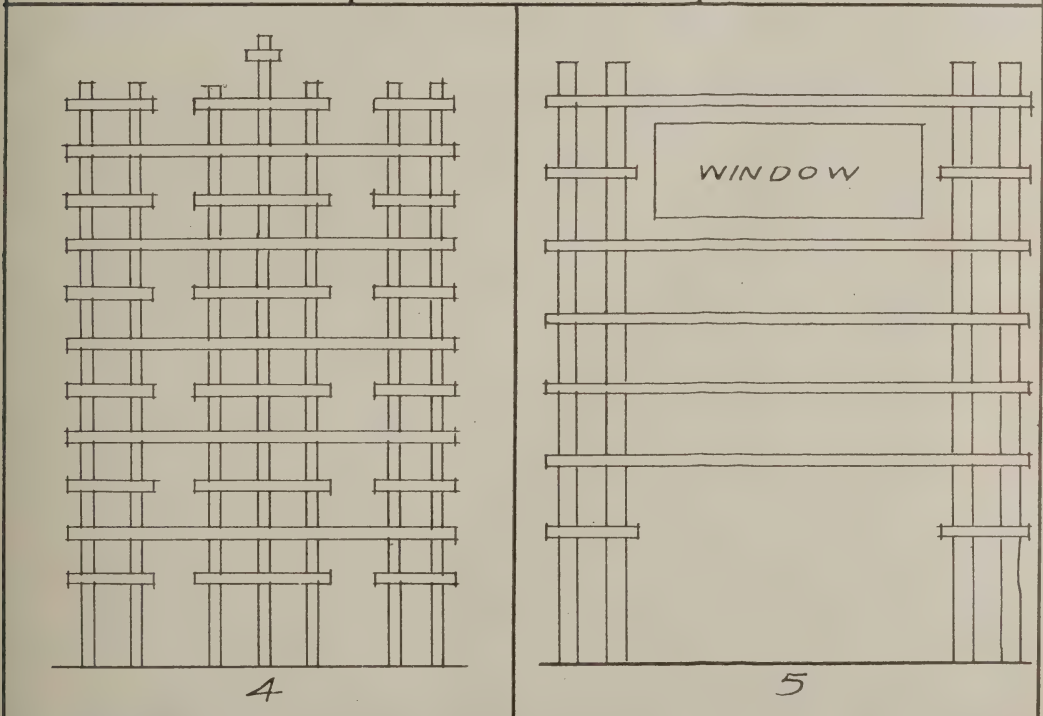
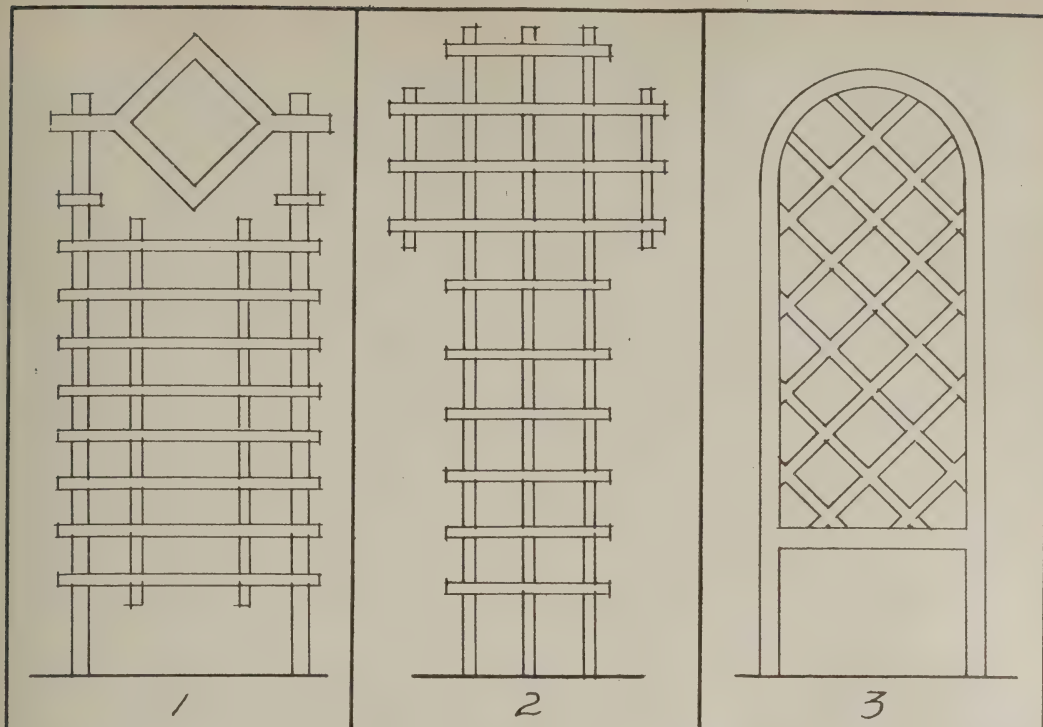
A very simple arbor over a walk is shown in Figure 8. It may be made any length desired. The posts are 6x6-inch, the girders 6x8-inch, the beams 2x8-inch, the top strips 1x2-inch and the bars at the side 2x4-inch in size. The posts should go into the ground about three feet.

Figure 9 shows a pergola porch which may be added to almost any device at no great expense. The columns should be 16 inches in diameter and the balance of the framework of the sizes marked on the drawing. Boxes for vines and flowers may be placed between the two center columns of each side. Boxes should be made with the sides vertical as a box with slanting sides does not give room enough for the roots of plants. Holes should be bored in the bottom to carry off the surplus water, and the box should stand on legs or blocks.

All lumber used in work of this kind should be the best grade of cypress, as such work should be free from imperfections of all kinds, which would impair its strength or durability.

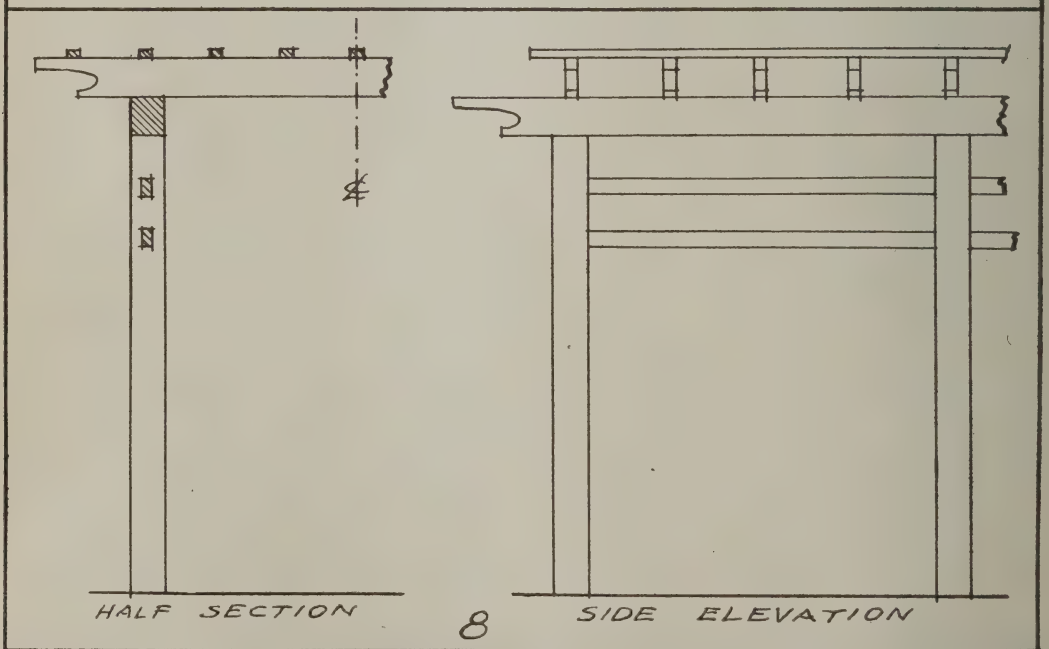
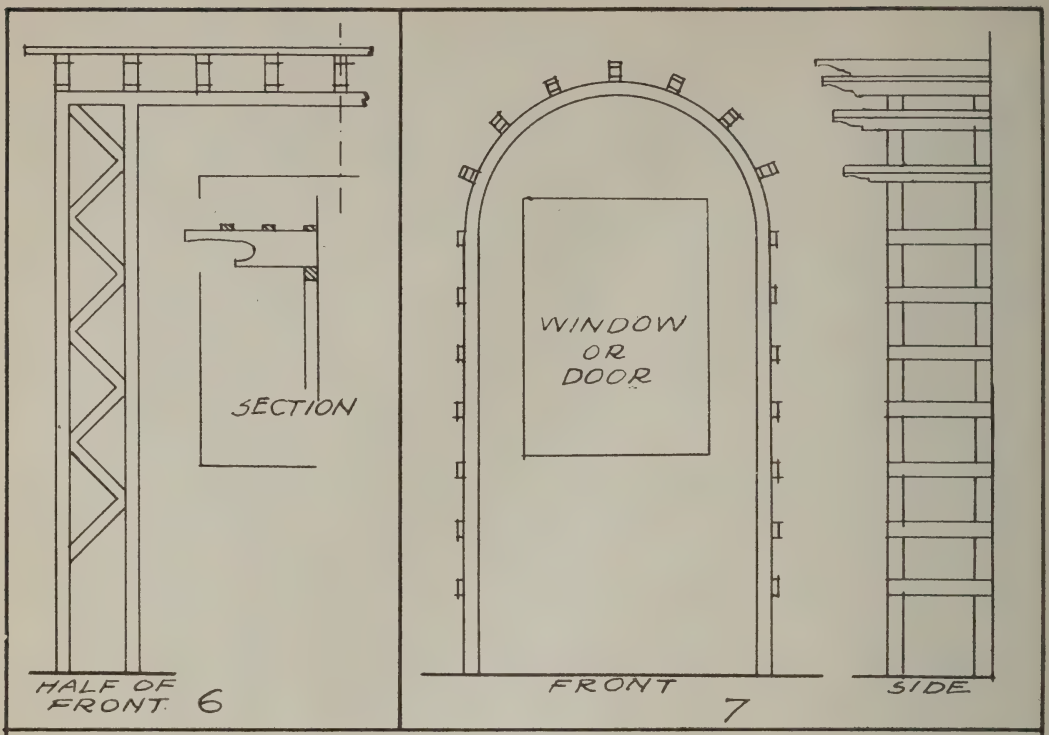
All work must be put together in the best possible manner, each in the various ways as shown in the drawings.

As to the painting of lattices, etc., it depends, of course, upon the colors of the house to which the work is attached. If the building is white, there is no better color than green for the lattice and if a pergola is used, all columns and beams should be white. If the house is of brick or is painted dark, white should be used for all lattice work. Three coats of paint should always be used and all joints and nail holes should be well puttied in order that the work may be protected from the weather. Trellises, arbors and the like are always out in the weather where they are subject to alternate heat and cold, moisture and dryness, and are usually covered with vines so that it is next to impossible to paint them without serious injury to the growing plants. This is why these most delightful adjuncts to a house need to be well painted before being put to use.

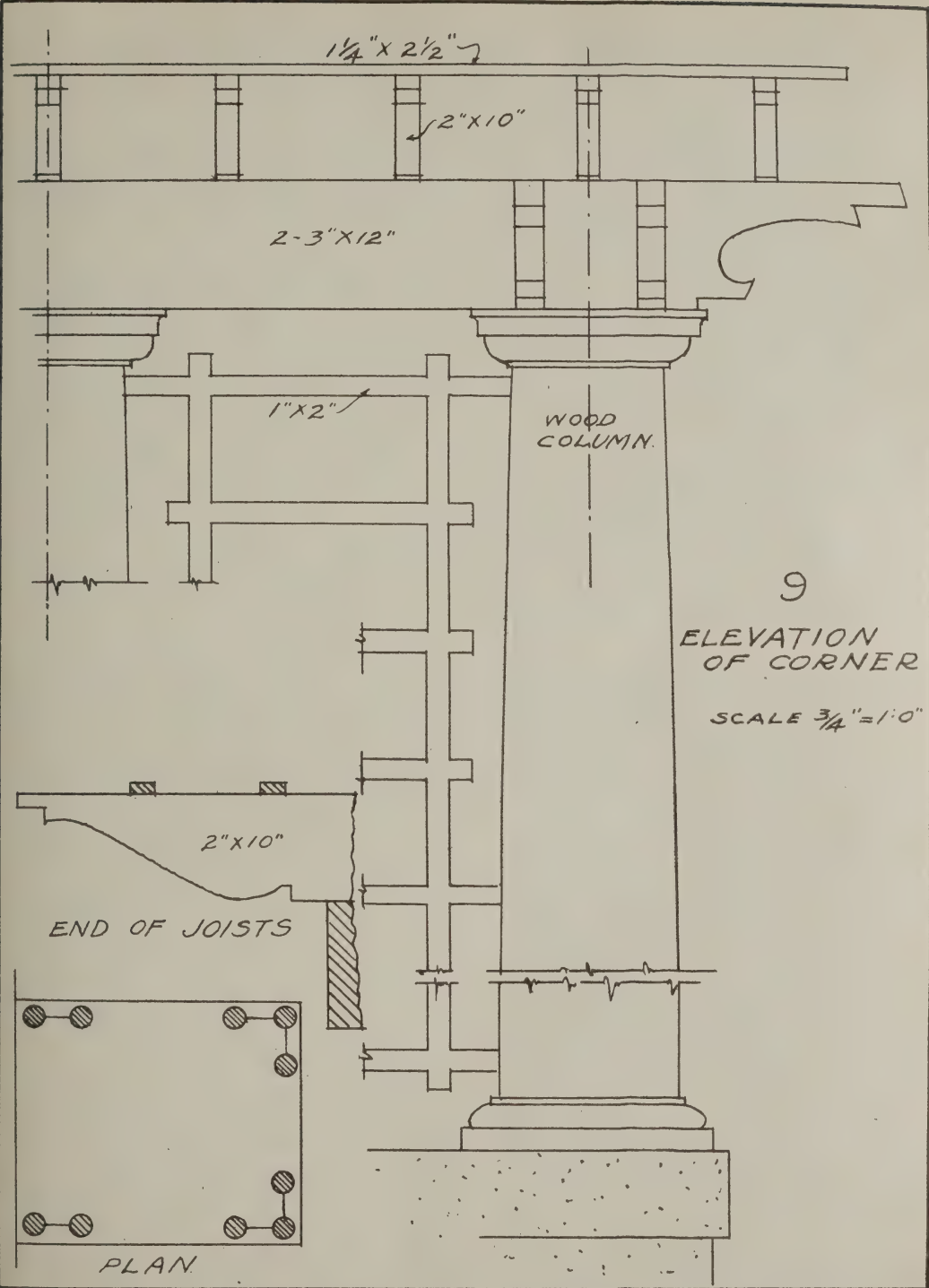


# TRELLISES





TRELLISES & ARBOR



A PERGOLA PORCH



# Estimating and Contracting

*Edwin L. Seabrooke*

**E**STIMATING on contracts frequently makes or breaks a man. It is so easy to underestimate on a job in order to secure it against all competitors that many builders and contractors today much prefer the cost plus commission method of building as a certain way out of the dilemma. It is certainly more just to both builder and client, for neither can then lose, and no exorbitant profit can be made by the contractor if his bid should happen to be larger than the conditions demanded.

But the old method of competitive bidding still prevails in most parts of the country, and it will continue perhaps for many years to come. The architect has a much easier time of it than the builder in making estimates. He arbitrarily makes his estimate on the cubical contents, assuming for convenience a standard cost per cubic foot.

This method is too careless and slipshod for the contractor. The architect is often thousands of dollars out of the way. If he assumes that a good wooden building in a certain locality can be built for 15 cents per cubic foot, and bases his estimate on this unit measurement, he will present his figures to his client as a guide. Now the client when bids begin to come in from the contractors is disappointed to find that the architect's estimate is altogether too small.

The cubical content method of estimating is merely a snap-shot guess, and nothing else. There is a great variety of prices found among architects as to the cost per cubic foot of a house. One will assume that a certain structure can be built for 18 cents per cubic foot; another says it can't be done for less than 20, and a third may estimate on 21 cents. The shrewd builder accepts the figure of neither, but begins his figuring from the foundation up and arrives at his estimate by a process all his own.

One of the weaknesses of the method of figuring on the cubical contents as a guide is that it does not adjust itself sufficiently to the fluctuation in prices for materials and labor. There are houses built a few

years ago at a cost of 18 cents per cubic foot that could not be duplicated today for less than 20 cents. It would be fatal for a contractor to take one of these houses as a guide.

The first essential in making reliable estimates is to keep cost sheets of materials and labor on file and constantly change and bring them up to date. The most successful contractors have such cost sheets indexed and filed away for ready reference. By a little comparison with the market prices of materials at any given time they can be used as a certain guide. If the net cost of brickwork is figured at \$14 per thousand with bricks at \$8 per thousand and labor at \$6 a day for good masons, the contractor would be all wrong in his estimates if bricks advanced or declined a dollar a thousand or if wages fluctuated up or down.

He must know first of all the cost of his material and labor at the time the job is to be done. It is even possible that a sharp variation may take place in the market between the time of bidding and actually beginning work. This is something that the shrewd contractor can often foresee if he is in close touch with the market. Before revising the cost sheets of labor and materials to fit any particular job it is wise to look even a few months ahead. Frequently on a rising market contractors can place tentative orders for materials on the strength of getting a contract a few months ahead, and arrangements can be made to cancel the orders if the job falls through. One cannot be too particular in this way to protect his interests.

With cost of labor and materials well in hand, the work of figuring out the total estimates of a job may then go forward. No two contractors follow the same line of figuring. One man figures upon the net cost of a job and then adds a percentage for profit. Another makes estimates of net cost and adds a percentage profit to each item as he goes along. For instance if he figures on brickwork at \$12 per thousand net, he adds \$4 for profit and puts it in at \$16 per thousand.

The contractor has far more elements of chance to contend with than the architect. The latter's figures are purely arbitrary and theoretical. The contractors must be of practical nature, making full allowance for strikes, delays by weather, and interruptions through delivery and differences with the architect and owner. There are a dozen and one contingencies that he must face, and if due allowances are not made for these he may lose on the job.

Another thing that a builder or contractor must take into consideration in making estimates is the character of his plant equipment. The cost of a big job can be reduced materially if one has a full equipment of labor-saving tools and implements, such as automatic hod carriers, derricks for handling heavy pieces, concrete mixers, wheelbarrows that can be lifted easily by carriers from the ground floor to the top and many other little things that count for efficiency. One whose work has always been confined to small jobs would not have such equipment, and he would have to subtract from the saving obtained by their use the cost of buying them new. The big contractor on the other hand would have all the necessary tools and appliances, and he would have an advantage over the small man.

The foreman and workmen under him are also factors in the situation that count greatly. A trusted foreman who can be depended upon to get a certain amount of work out of his men on time is often of more value to a contractor than anything else. A new foreman might bungle the job and reduce the efficiency ten or twenty per cent. Poor mechanics may upset a man's estimates so that a profit can be turned into a loss.

As an illustration of the value of good tools as well as good mechanics, a contractor had to tear up the concrete base of a floor in which mosaic tiles were laid as a result of a mechanic's inaccurate level. Neither he nor the mechanic took the trouble to check off his level to see if it was plumb. The floor was laid and the tiles set before the contractor's eyes made him question it. The mechanic proved by his level that it was correct. Still doubting it a new level was purchased and laid on the floor. The bubble would not come into the middle. The old level was out of plumb,

and hence the floor was. There was no way other than to tear up the floor and do it over again, which cost the contractor a good sum. It is thus quite essential that a contractor should see before a job is undertaken that the workman has the proper tools. Otherwise his calculation may be entirely off.

In bidding against competitors a contractor who finds his bid a good deal lower than any of the others is startled before he is jubilant. Of course he wants the job; that's why he bid for it, but to find his figures way below the others makes him feel that there is something wrong. His first thought is that he has made an under-estimate through a mistake, and he is worried until the figures have been carefully checked up. It is a simple matter to make mistakes with figures, so simple that the most successful contractors never trust themselves alone in making an estimate. They have somebody else to check them off, but this is often done perfunctorily. Another person going over his figures may pass over the same mistake without discovering it.

The most satisfactory method is that found in practice in one of the biggest contractor's office in the country. Two independent estimators are set to work. They first revise their cost sheets of material and labor and then proceed without consulting each other in making up the estimates. If they both agree or come within a few hundred dollars of each other, it is pretty good evidence that they have not made errors. But if one is a thousand or two dollars above the other, a comparison of the two sets of figures will bring to light the reason for the great difference. This method of estimating and checking up each other's figures enables a contractor to put in a bid without fear of loss. If his figures are way below those of all rivals he still has sufficient confidence in himself to go ahead without fear.

It is the most common thing in the world for a contractor to lose on one job and make on another. If his profits on one do not more than make up for his losses on the other he is heading straight for bankruptcy. In few other lines of business would such conditions be tolerated. There must be a reason for it. Barring unforeseen accidents, strikes and labor troubles, the contractor should be able to figure just as sure-



ly upon one job as another. If he does not there is something at fault with his system. Usually it is carelessness. In his haste he has overlooked some little thing or misunderstood the architect's specifications.

Misreading and misunderstanding the specifications of an architect have perhaps caused more losses and disagreements than any other one thing. Now many an architect is just as careless as the contractor. Some parts of his specifications may be wrong or confusing, or there may be two methods of interpreting them. The contractor who assumes that he understands without having it down in plain black and white invites a risk that may entail a great loss upon himself. If there is anything uncertain in the wording or any chance of misinterpretation of certain parts of the specifications he should have the matter cleared up with the architect before figures are submitted. A reliable architect instead of resenting calling him to account for a mistake will thank the contractor, for he realizes that if left uncorrected it might get both into trouble. A little tact and diplomacy in showing the architect his error would not hurt.

The contractor today finds his business raised to a higher standard than ever before, and old, obsolete methods do not prevail. Other contractors are studying efficiency, and they are getting better work out of their men. As a result of this a shrewd business man can make a low bid and still realize a fair profit, while another man

might lose on it at that price. The loss of time through fussing at the beginning and preparing the scaffolds and preliminary stages of a contract must be eliminated so far as possible. The contractor must consider in his work of estimating, then, his own efficiency and that of his plant and workmen.

The margin of profit to allow so that one is perfectly safe is a question that vitally concerns every contractor. Ten per cent profit on the completed building when the cost plus commission method is followed is good pay; but the contractor bidding in the ordinary way could not be safe on that percentage. There are too many uncertainties to contend with. He must allow more to keep well within his rights. Unless one is very anxious to secure a job to keep his men working or to establish a reputation in a new locality, he must allow at least fifteen to twenty per cent profit. If everything goes well he will make a handsome profit. If things go contrary he may still pull out with enough profit to pay him fairly well for the work done.

The best system of estimating is liable to get out of joint unless given individual attention. Some contractors adopt a rigid system and stick to it. They are so sure of it that they will turn the formula over to a clerk or typewriter, and leave the job to him or her. The results once in four or five times are bound to be disastrous. Every system must be more or less flexible, and above all it needs the individual oversight of the man most vitally concerned.

# Engineering For the Contractor

## Eighth Article

### A CONCRETE SIDEWALK LAYOUT

**S**IDEWALKS are largely a matter of levelling, although there is often a good deal of work with the transit. This consists principally in lining up the stakes or marks to locate the edges of the walk, for it is seldom that a city surveyor leaves all the necessary points which the workmen require.

A few cities and towns are so level that grades are unknown, in which case the walk follows a level line on each side with a uniform pitch from one side of the walk to the other, just enough to run the water

off to the curb. In others there may be a number of items which disturb the ideal condition mentioned. In Fig. 12 is seen a typical sidewalk job.

This shows the front of a new building, presumably under construction, and A-B-C-D—the location of the new sidewalk, stopping against the alley at C-D and returning against a sidewalk in place at E-F. The street slopes down both ways from A, the point D being 1 ft. 8 in. lower than A, and E being 5 in. lower. A walk 10 ft. wide runs from the sidewalk to the main entrance at the center of the building.

The sidewalk terminating at J-K is in place, but across the alley from the new walk. The sidewalk G-H is also in place, but across the street. The grade is regular on Main Street, being one inch in ten feet.

The contractor must first prepare a drawing similar to Fig. 12, showing the plan of the operation. Note that the elevations are enclosed in circles to distinguish them from any measurements which might appear and which might confuse one.

#### LINING UP THE WALK

Having prepared a plan with all the dimensions and drawn circles where we want elevations, we will begin by setting up our transit at the point *x*. This can be anywhere beyond the point H, but must be exactly over the edge of the curb, or edge

manner find and mark A. On the side line, E is of course already located by the sidewalk in place.

The inside lines B-E and M-F can be readily and easily found by measuring in from the points A, D, and B, the last being first located on the line A-E.

It would be possible of course to set up the instrument again at G or J or on any point on their line and so locate B-E and any other points. But if you get the curb line right the chances are you can measure across to get the width right.

It is apparent that a line 200 ft. long will sag or blow out of line or be in the way, so it is better to locate intermediate points, say at 50 ft. intervals. The center line *o* should also be located as it is the center of the walk to the building.

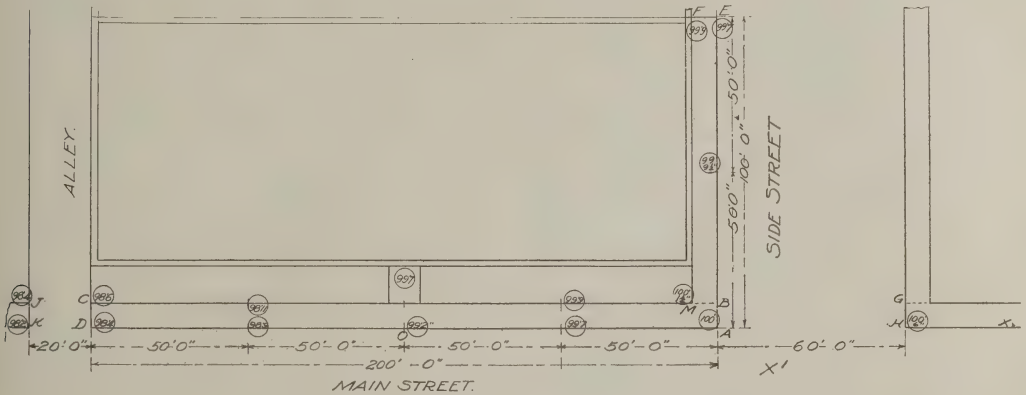


Figure 12. Laying Out a Cement Sidewalk.

of the walk. With the plumb-bob get this as accurate as possible, for we only have to set the instrument up *once* to get the lines for the entire side. Sight along the curb to H and see if it lines up with K. It should, and we will assume that it does. Now have two assistants to hold a steel tape to get the *distance* K-D right. Straighten up the stake so the center is as near as possible in line and the right distance from K. When the stake is down solid mark *across* the stake using the point K as a center and the 20-ft. mark on the tape as a radius. Then sight through the instrument, holding the point of a pencil on the line; you can probably readily see the point at that distance, but if not, hold a white card back of the pencil. The point of the pencil will locate the exact crossing of the two lines and locate D exactly. In similar

layout of this walk entails no particular difficulty.

Now having the walk accurately laid out for location we must locate the grade marks. As it pitches in two directions we have some interesting problems. As in our previous example we will take our principal corner A as plus 100 ft. and reckon entirely from that. Perhaps we can get a grade mark from the city surveyor or can work from the building, but in any event we have the points H, K and E already in place. Our survey shows D is 1 ft. 8 in. lower than A or 98 ft. 4 in. The point E should be 6 in. lower than A or 99 ft. 6 in. The points K and H should be checked up also to be sure everything is right.

The back line of the walk can be readily figured out, remembering that the walk is



8 ft. wide and slopes  $\frac{1}{4}$  in. to the foot. The back is therefore 2 in. higher than the front. The cross walk to the entrance will be 5 in. higher than at o. Go over the figures carefully to be *sure* they are right.

At M we have an unusual condition. If we set this off from the line A-E, B will be two-fifths of an inch below A, which is a rather difficult measurement to figure out. But M is also opposite a point in A-D four-fifths of an inch below A. Any point between these, say one-half inch, will be near enough for our purpose and as the walk pitches 2 in. we would have the point M as  $el + 100 \text{ ft. } 1\frac{1}{2} \text{ in. } (+ 100 + 2 \text{ in.} - \frac{1}{2} \text{ in.})$ , being the highest point of the entire walk.

In the center of the front at o we find the elevation is  $+ 99 \text{ ft.} - 2 \text{ in.}$ , while against the building it is 5 in. higher or  $+ 99 \text{ ft.} - 2 \text{ in.}$ . Here we have another place where the contractor must use his judgment. Technically, this cross walk should slope both ways, down to the curb, and down with the street. This would look badly, however, although the width, 10 ft., would mean only 1 in. pitch across the walk. We will make it *level* across and pitch it only to the street. This will make the walk twisted but not enough to be noticeable. By making the walk at  $+ 99 \text{ ft. } 7 \text{ in.}$  we will have a pitch of  $2\frac{1}{2}$  in. to the main walk on the high side and  $3\frac{1}{2}$  on the low side (check up on Fig. 12).

These elevations shown on our sketch or layout must be transferred to the site. Suppose we set up the level at X<sup>1</sup> we can reach all the points from here. Now starting at A determine the elevation *on the rod*. Suppose to save time it is 5 ft. exactly, added to our established grade of  $+ 100 \text{ ft.}$ —make the elevation of the target  $+ 105 \text{ ft.}$  All of our elevations on the plan are figured on the basis of from the same point A, so it is only necessary to *subtract* their elevation from  $+ 105 \text{ ft.}$  to get the reading *on the target*. For instance, D being at  $el. + 98 \text{ ft. } 4 \text{ in.}$  means on the rod,  $+ 105 \text{ ft.} - 98 \text{ ft. } 4 \text{ in.}$  or 6 ft. 8 in. Set the target at this height, place the rod against the stake at D and raise or lower the rod until the cross hairs intersect the target. *The bottom* of the rod is then at

the required elevation. A mark can be made on the side of the stake, or a tack driven in, and the elevation marked on the stake at that point. The remaining points can be located in a similar manner.

Variations of this system will be found on almost every sidewalk job. The contractor should get all the information possible from the city surveyor, from the architect or his representatives and from the general contractor if there is one over him. He should in every case get his drawing complete before he starts to lay out the work for if he does not he will probably find some such condition as at M, or the cross walk, and have to figure it out as he goes along, with a greatly multiplied liability to error. A nicely laid out sidewalk is a credit to everyone concerned, and it is one of the things which can make or mar the appearance of the entire project. If in doubt, ask and get everything clearly on paper before you go too far. Use the instrument frequently. Stakes will get pulled out and misplaced. Sometimes a workman will try to drive a stake back where it was before and get it out several inches, beside changing the grade marks. In the above operation, we set up the instrument only twice. It could have been all done from the first point with one setting if necessary. The time required to *check*, immediately before it is too late, is the best spent time on the job. Get your foreman to appreciate this and to use the level, too. He can do it and it will help him a lot. Let the workmen know that you can and will check them up, and they will be more apt to see that everything is all right, before they begin tamping the concrete.

If you have a particular owner to work for, let *him* squint through the telescope and see how absolutely exact you have laid out the work. Show him how easily you can detect an error of an eighth of an inch in fifty or a hundred feet. Let him see your plans and figures too. He may not understand all of them, but he will have a better opinion of you just the same.

NOTE:—This is the eighth of a series of articles for the Contractor, showing the advantages of using modern engineering instruments. The ninth will appear in an early issue.

# The Marking of Oblique Cuts

Edward Hardy

## THE OBLIQUE PLANE

THE next two diagrams show that the method of developing cuts whose plans cross the plan-widths obliquely is exactly the same as that for developing cuts whose plans cross the plan widths perpendicularly. A B and C D (Figure 185) shows the inclinations of the breadth and length respectively of an oblique plane, and

J, is the true position of the other end of the cut. E K is the position of the cut.

Figure 186 is a reproduction of the plane shown in the last diagram, the inclinations and the plan of the cut being the same, but the horizontal trace F G is drawn from the opposite end of E F, the plan of the cut. The point F, being on the horizontal trace, it is only necessary to locate its position

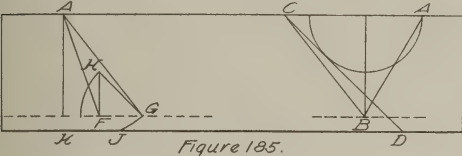


Figure 185.

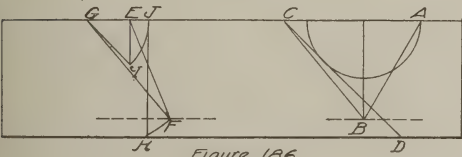


Figure 186

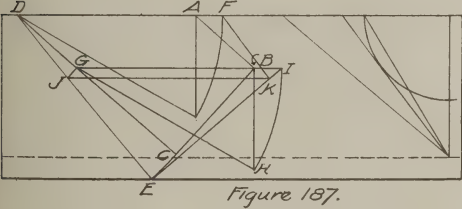


Figure 187.

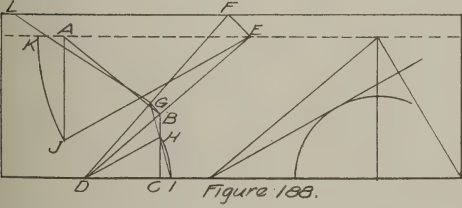


Figure 188.

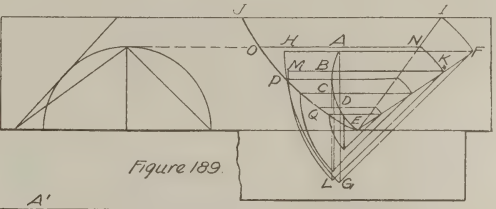


Figure 189.

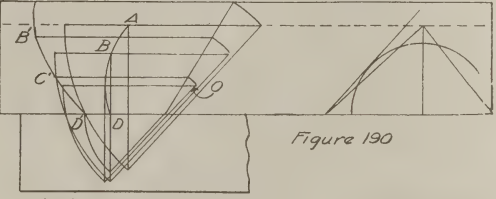


Figure 190

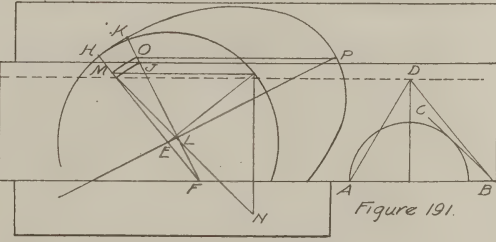


Figure 191.

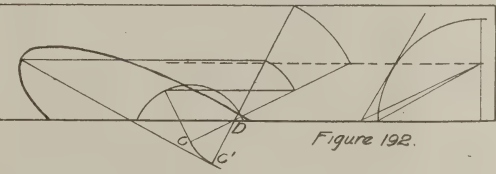


Figure 192.

C B is its horizontal trace. E F is the plan of the cut and E G is a horizontal trace drawn from one end of it. E, being on the horizontal trace and at the edge of the surface, shows the true position of that end of the cut. The plan gives F G as the distance of F from G, but its real distance is G H or G I. J is the true position of G, and K, a point at a distance equal to G I from the point

on the edge. With G as a centre and radius G F, describe the arc F H. H is one end of the cut. G E shows the horizontal distance of the other end of the cut from the horizontal trace. G I gives its true distance. Make G J equal to G I. H J shows the position of the cut.

Figure 187 shows an oblique plane, and A B and B C are the plans of two cuts which



intersect at the point B. The horizontal trace may be drawn through any one of the three points A, B, or C. Let CD be the horizontal trace. The true positions of C and A are determined as before. The former is found by revolving C to the edge, and the latter by finding the true length of DA and setting it off on the edge as DF. E and F are respectively the true positions of C and A. Find the horizontal distance of B from the trace DC by drawing BG parallel to the length of the plane. From G set up the pitch line GH to intercept a perpendicular from B, and make GI equal to GH. GI is the true length of GB. Join DE. With D as a centre and DG as the radius, describe the arc GJ. J is the point represented in plan by G. Draw JK parallel to the edge, and make it equal to GI. K is the true position of the point B. Join FK and KE to obtain the positions of the cuts.

Figure 188 is given to illustrate the development when the horizontal trace is drawn through the point of intersection of the plan lines of two cuts on an oblique plane.

AB and BC are the plans of the cuts, and development of the line DE, and the arc DE is the horizontal trace. DF is the development of the line of DE, and the arc BG determines G, the true position of the intersection of the cuts.

DC gives the horizontal distance of C from the trace; DH is the distance when measured on the inclined line. The correct position of C is obtained by making DI equal to DH.

The distance of A from the horizontal trace is represented in plan by EA. Its real distance is given by EJ or EK. F is the position of E on the edge of the surface, so the position of A is obtained by making FL equal to EK. LG and GI give the positions of the cuts.

By selecting suitable points on the plan, finding the true position of each, and joining by curved or straight lines as indicated on the plan, the true shapes of the intersections of oblique planes with circular or moulded surfaces can be obtained.

Figure 189 shows an oblique plane whose inclinations are indicated in the drawing for ascertaining the plan width and the horizontal trace. ABCDE is the plan of its intersection with a vertical circular column. EF is the horizontal trace. Since

E lies on the trace and is at the edge of the surface, it is shown in its true position. A lies at a horizontal distance of AF from the horizontal trace. FG or FH is the actual distance of the original point from F. But I is the position of F on the edge, and J, a point situated at a distance from I equal to FH, is the position of the point of which A is the plan.

Similarly with the point B:—BK is its plan distance from the horizontal trace, and KL or KM is its actual distance; N is the true position of K, and Q, a distance of KM from N, is the true position of B.

F and Q, the true positions of C and D, are determined in a similar manner. A curved line through JOPQE gives the shape of the cut.

The horizontal trace can be drawn through any convenient point. Figure 190 shows the development of a similar cut by drawing the horizontal trace through the center with which the plan of the cut is drawn.

It is much easier to draw the shape of the intersection of an oblique plane with a vertical cylindrical body by means of the major and minor axes.

Figure 191 represents a surface which is to be fixed in an oblique position against a vertical circular pillar. The angles BAD and ABC show the inclinations of its breadth and length respectively to the horizontal plane. BD is the horizontal trace, and E the plan of the centre of the pillar. Through E draw the horizontal trace FG. If necessary, produce this line until it meets the arc showing the plan of the pillar. EH is the plan of a line lying horizontally on an oblique plane. It passes through the centre of the pillar, and is equal to the radius. Hence it represents the plan and gives the true length of the semi-minor axis of the ellipse. Obtain FJ, the true position of FG. It has already been shown that any point in FG is represented in FJ by a point at an equal distance from F. It can also be shown that if these lines be produced in either direction a point taken in the one will be similarly represented in the other. Set off FL and FK equal to FE and FH respectively. LK shows the true length and position of the semi-minor axis.

EI, being a radius drawn at right angles to the plan of the minor axis, is the plan of the semi-major axis. The true position

of  $E$  has already been ascertained, and it only remains to find that of  $I$  in order to determine the semi-major axis.  $MI$  is the horizontal distance of  $I$  from the trace, but  $MN$  is its actual distance.  $O$  is the true position of  $M$ , and  $P$ , a point at a distance of  $MN$  from  $O$ , is the true position of  $I$ . Join  $PL$  and produce it, making  $LQ$  equal to  $LP$ .  $QP$  is the major axis.

Having obtained the major and minor axes, the curve can be drawn by either of the methods given earlier.

The point  $P$  can be located without setting up the pitch line  $MN$ . Find  $O$ , the true

position of  $M$ . The point  $P$  lies on a line drawn from  $O$  parallel to the long edges of the surface. The major and minor axes of an ellipse being perpendicular to each other,  $P$  lies on a line drawn from  $L$  at right angles to  $LK$ . The intersection of these two lines gives the point  $P$ .

Figure 192 is a case in which the plan of the centre of the cylinder lies outside the intersecting surface. It also shows the shape the cut assumes when it does not extend across the surface.

Although the horizontal trace has been produced,  $D$  is still the point around which it turns.

## Winter Work

What Are You Planning to Do to Keep Busy?

*J. Crow Taylor*

SOME of the carpenters and builders talked to lately have expressed some apprehension about what they are going to do this winter to keep busy and keep the wolf from the door. The stringency in the money situation which, though fortunately passing now, has had the effect of producing an order of thrift in the country, of saving and cutting down expenses and spending just as little as possible. The result of all this is that many who might have been induced to make repairs and additions during the winter months are now inclined to put it off and hold on to their money, and others who thought something of building are waiting till spring, thinking that times will get better. So in many sections the building prospects look unusually blue as we go into the winter season.

This is causing some apprehension and many are speculating on just what they can do to keep busy and keep the work going on, to employ themselves and the men of their crews. If you have not faced this problem and figured out what you intend to do, it is time to get busy, because it is going to take enterprise and hustle to keep things moving during the winter, which makes it a good time to try out new ideas.

### WHAT ONE MAN DID DO

There was once before a winter something like the present one in the matter of hesitancy on the part of people to spend money, and one carpenter who didn't like

being idle and believed in working all the time, found himself in a position where there was not much demand for his work. There was practically no new building and nobody wanted to make extensive alterations. Meantime he needed money to provide for the family and he needed work to keep him satisfied and happy. He had a very nice little shop in connection with his home, so he put in the first of his idle time getting this in good order and fitting up all of his tools, watching out meantime for whatever stray jobs he could get. Then between jobs he took to working in his shop. He had a little lumber about of the kind that every builder accumulates and he had a scroll saw and a turning lathe of light type, operated by foot power. So when there was nothing else doing he set to work with these, making clock shelves, bric-a-brac and wooden novelties of one kind and another that he thought might appeal. He would make up a bunch of this kind of stuff, then take it with him and start on the rounds going from house to house offering it for sale. It was not an inviting proposition by any means, but he was a man who didn't believe in staying idle or laying down and whining about hard times, so he squared his shoulders and went at it. Of course he was turned off gruffly from many homes, but now and then he did make a sale. Also by persistent inquiry he unearthed a little job of alteration here



and there. One place he would get a job of putting a single sash window in a kitchen; maybe at another place he would find a few broken lights in the basement to repair. Occasionally he would unearth some furniture in need of repairs, and now and then some housewife would express a desire for a cabinet or some article of woodwork. These things didn't come steadily or easily, and there were many empty handed turnings away from houses between times, but he persisted and eventually he prospered, even through that trying winter. When he got through he found he had sold lots of bric-a-brac and had made quite a fair sum at repairs and alterations, and in fitting up cabinets and closets and during the winter he had acquired lots of new knowledge and much greater skill at doing cabinet work and special jobs. So while he entered into this work unwillingly and simply under the stress of circumstances and met with many discouraging days during the winter, he looks back upon it now with pride as one of the seasons of his greatest accomplishment. The pleasure in it comes from the fact that he accomplished what he did in the face of about the most discouraging conditions he had met up with in his career.

#### HOW MACHINERY HELPS

What this one man did should be an inspiration to others and prevent discouragement. At the time he did this we had very little in the way of power driven machinery for the wood shop. Today this machinery can be made to help out wonderfully. One can, with the light power driven machinery that is offered today, do much more of this same kind of work in less time, for less money and make better profit out of it. Indeed, it is the power driven machinery that offers many a carpenter his opportunity for profitable work during the winter season.

If he is so well provided from his summer work that he does not need to hustle in this way to get provision for his family during the winter, he can use the season advantageously in furthering whatever repair work and novelty work he may develop a profit in. Then he can convert all his accumulation of odds and ends of lumber and timber into products that will help him in the spring. Many a man will know fairly well in advance what he may need in the way of cellar frames and sash and these

he can make up during the winter season. He can work some of his accumulations into plinth blocks, window and door head stock and have a general clean up and converting of lumber into something ready for immediate use when the building season opens again. Even the rough scrap can be cut up into bridging and carefully piled away and a lot of work of this kind can be done.

Meantime, however, one should not overlook the developing of business in interior alterations and repairs, the putting in of extra windows, weather stripping, the building of cabinets and closets, and last but not least, the repairing of furniture.

In the repairing and making of furniture we have a line of work that should be more conspicuously identified with carpentering. There was a time in the past when practically every carpenter put in his spare time making furniture. Some of the best of the old time furniture that brings big sums of money now was made in just this way. When furniture manufacturing was developed in this country the carpenters turned more to carpentering and neglected these cabinet features with the result that today the average carpenter is not in as close touch with or doing as much of this kind of cabinet work as he should be.

In the winter time is the ideal time to develop this trade and get in touch. Nearly every family has some furniture that may be repaired to advantage and furniture that can be cleaned off and refinished. Some will want built-in cases and now and then one will find some one wanting a certain kind of furniture, maybe to fit a certain nook or corner, or of a pattern that is not available. This gives the carpenter his chance to get into the game, and if he has a knack for this kind of work what he accomplishes one winter will be an advertisement for another winter.

So while the winter season may be dull so far as new building undertakings are concerned, it really need not be a dull time for the enterprising carpenter, because there is plenty of work for him to do that can be developed if he will go after it and keep after it in the face of occasional discouragements and persist until he builds up a following. Moreover, he should eventually develop a reputation for winter work as well as one for house building, so that he will find trade ready for him, just a different order of work, but something to do,

right along through the winter as well as during the busy summer building season.

And, as stated above, power driven machinery helps wonderfully in this work, and in the winter is the time when the shop and the machinery pays its way and helps make profit. Every man naturally takes a pride in having a nice, comfortable shop with an

equipment of machinery that will help him do odd jobs. These may be neglected some when there is outside building in the summer, but they come in fine for the winter, and during the winter is the time when a man should live in his shop with his machinery and fare just as well as he does outside during the summer.

## Some Notes on the Steel Square

**A**N arithmetical problem can be solved on the square, as shown in Figure 8.

For example, if 1,200 feet of lumber costs \$15.00, what will 800 feet of lumber cost? Place the numbers 12 and 15 on the blade and tongue, on the edge of a board. From the point 8 on the tongue draw the dotted line parallel to the points 12 and 15 on the blade and tongue, cutting the blade at the point 10.  $12:15::8:10$  dollars the answer. Again, if 1,200 feet of lumber costs \$15.00, what will 1,100 feet of lumber cost? From the point 11 on the tongue, draw the dotted line parallel to the points

Place the square on the line, with half the distance A B on the tongue, for the given side. Then A B and A C equals the size, and A B C equals the angle required.

Figure 11 exhibits the operation of finding the diameter of a circle, the contents of which shall equal the contents of two given circles.

Place the square on the line A B, with the diameters of the given circles on the blade and tongue; then A B equals the diameter of the circle required. If a fourth circle is required, the contents of which shall equal the combined contents of those

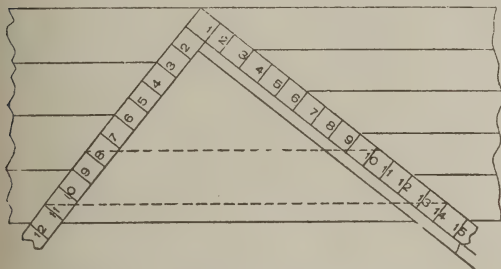


Figure 8. Arithmetic with the Square.

12 and 15 on the blade and tongue, cutting the blade at the point  $13\frac{3}{4}$ . \$13.75 the answer.

Figure 9 exhibits the operation of bisecting acute and obtuse angles, by the use of the square.

Place the square on the lines A C and A B of the acute angle B A C with equal distances on the blade and tongue. Mark along the blades for the point of intersection D; join A D, which will bisect the angle B A C. Draw A E at right angles to A D; then A E bisects the obtuse angle C A F.

Figure 10 exhibits the operation of finding the size and angles for a hexagon, or a six-sided figure, when the length of the sides are given.

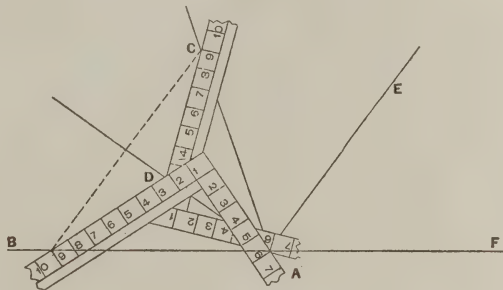


Figure 9. Bisecting an Angle.

already drawn, from the points A and B draw the diagonals indefinitely, from the point of intersection as center, describe the circle required. If a fifth circle is required, the contents of which shall equal the combined contents of those already drawn, from the point D as center, with D B as radius, describe the circle required. This rule applies to the enlarging or diminishing of triangles, squares, boxes, shafting, and vessels, and can be continued indefinitely.

Figure 12 exhibits the operation of finding the sides and angles for an octagon, or an eight-sided figure, when the side of an enclosing square is given.

Place the square on the line A D, with



half the side of square on the blade and tongue; then 3-D equals the distance to gauge from the edge, for the angle to be removed.

To find the side of a square which will make an octagonal figure, when the width

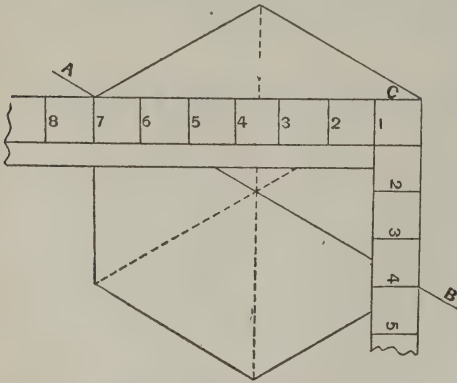


Figure 10. Finding the Size and Angles for a Hexagon.

of sides are given. Set off from 3 to 2, and from 3 to 4, equal to the given side; draw 4-5 parallel to the tongue; then 2-5, equals the side of square, and 3-6 equals the distance to gauge from the edge for the angle to be removed.

By calculation: Suppose we have a lot of ground 40 feet square, and want to know

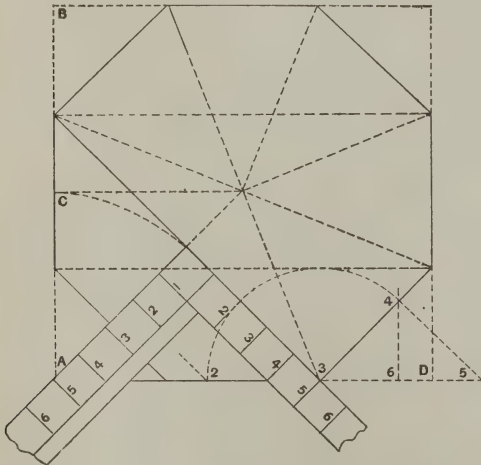


Figure 12. Finding Sides and Angles for an Octagon.

how far to measure from the angles to form an octagon. Forty feet  $\div 2 = 20$  feet,  $\times 20 = 400$  feet,  $+ 400 = 800$  feet,  $\sqrt{800} = 28.28$  feet.  $40 - 28.28 = 11.72$  feet, the distance required.

Suppose we want to find the dimensions of a lot of ground that will make an octagon, the sides of which shall equal 20 feet.  $20 \text{ feet} \div 2 = 10 \text{ feet}$ ,  $+ 10 \text{ feet} = 100 \text{ feet}$ ,  $+ 100 = 200 \text{ feet}$ .  $\sqrt{200} = 14.14 \text{ feet}$ ,  $+ 14.14 \text{ feet}$ ,  $+ 20 \text{ feet} = 48.48 \text{ feet}$ , the dimension required.

To find the area of an octagon multiply the given side by 8, the number of sides, the product by  $\frac{1}{4}$  of the side of the enclosing square.

Figure 13 exhibits a geometrical solution of squaring the circle, and also of an inscribed ellipse.

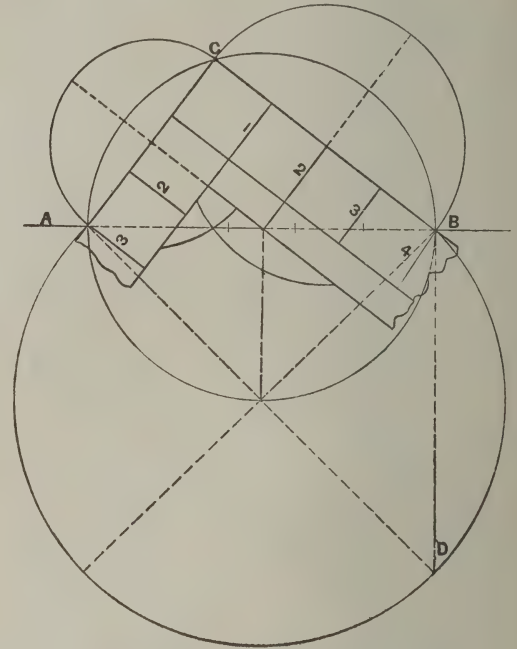


Figure 11. Problem with a Circle.

To find the side of a square, the contents of which shall equal the contents of the circle, in square measure. Divide the diameter A B into 14 equal parts; from the point A as center describe the arc 3-C; draw the chord D S tangent to the arc, and equal to the side required.

To shorten the operation: Square up from the point 3, cutting the circle at F. Place the square on the points A, B, and F; then F B on the blade equals the side required. Again, place the square on the points A and B, with  $6\frac{1}{2}$  of the parts of division on the tongue; then the chord on the blade equals the side required; or place the protractor, and draw the line B F to

the angle of 27 degrees of elevation, cutting the circle at F for the distance required.  
To find the side of a square, the contents of which shall equal the contents of an in-

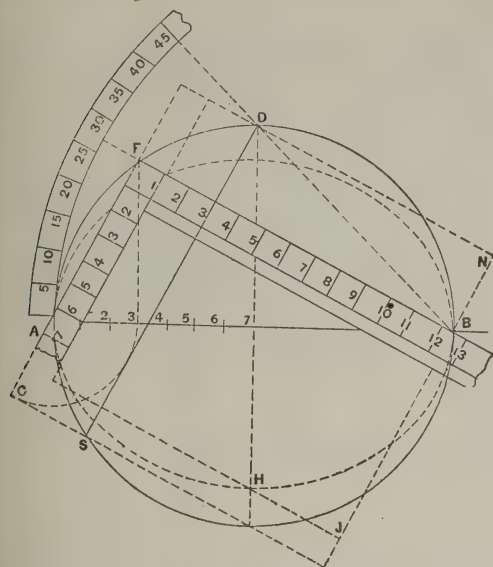


Figure 13. Squaring the Circle.

scribed ellipse; draw H J parallel to S C; then J N equals the side required.  
Figure 14 exhibits the operation of find-

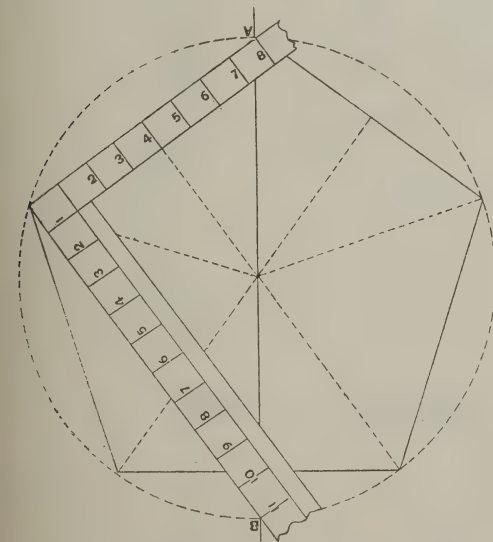


Figure 15. Finding the Angles to Form and Mitre a Five-Sided Polygon.

ing the angles for an equilateral triangle, and also the angle of intersection to mitre the angles.

By the use of the square: Place the square on the line A B, with 15 inches on the blade, and 8 5/8 inches on the tongue; mark from the blade for the angle of intersection, or mitre, and from the tongue, for the angle. The same figures are also used for mitreing a six-sided polygon.

To find the area of an equilateral triangle, multiply the side by half the altitude.

Figure 15 exhibits the operation of finding the angles to form and mitre a five-sided polygon.

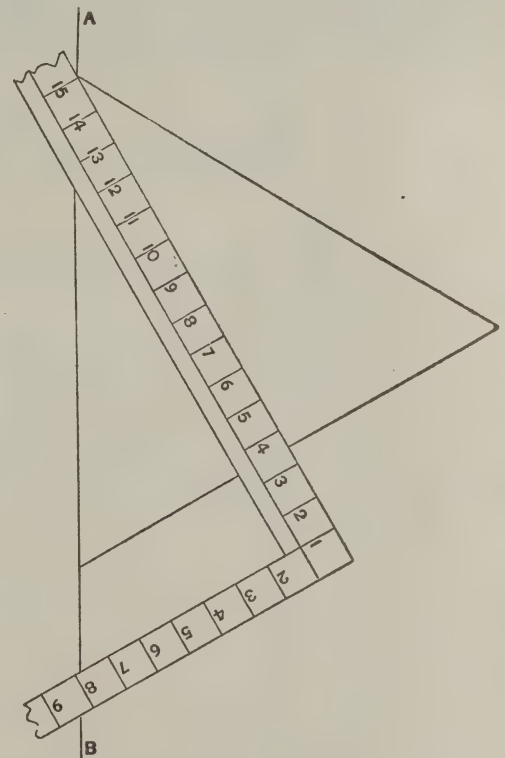
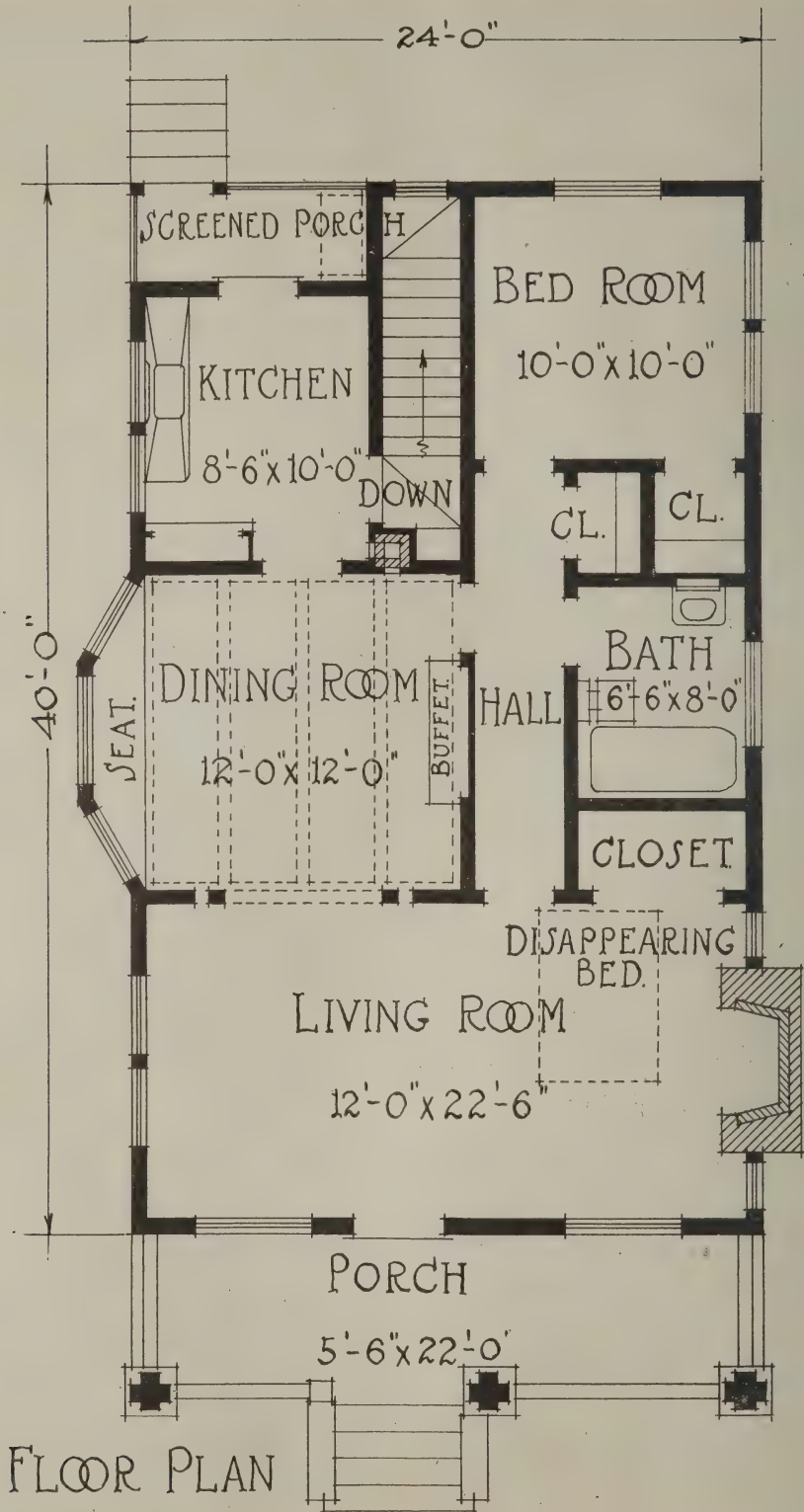


Figure 14. Finding the Angles for an Equilateral Triangle.

By the use of the square: Place the square on the line A B, with 11 inches on the blade, and 8 inches on the tongue; mark from the tongue and side, for the angle to form the polygon; and from the tongue and line, for the mitre required.

To find the area of a polygon, multiply the side by 1/2 the altitude of the triangle and this product by 5.







Exterior of a Bungalow, Sensible in Plan and Design.

## A Sensible Bungalow

*Jud Yoho, Architect*

**W**HAT constitutes a Sensible Bungalow? The plan must be well connected, making all the space count. The rooms must be large enough to be livable, so that with only the family they will not appear too spacious, nor when company comes, they will not be too small. The Sensible Bungalow, therefore, must first of all be well planned for the family which will occupy it.

Then the exterior must be pleasing, not too much attempt at decoration or ornamentation. No more bay windows, exposed chimneys, or porches than are necessary, no fancy carved rafter ends or panelling. Only a limited amount of art glass squares in the front windows.

Naturally, a small bungalow means the cost must harmonize with the plan. This also co-operates with the decoration and detail.

The architect in this case has considered every phase of the situation. The porch extends across the front, but only half is roofed over, giving more light in the living room to offset the loss of light around the fireplace.

Additional convenience is found in the disappearing bed in the living room. It may not be strictly according to Vignola, but a disappeared bed is better for looks when not in use, while it is more comfortable than the convertible davenport. The bed fits into the closet and leaves the living room complete without it.

Notice the Dining Room. The window seat is convenient, and the buffet is well placed. Panelling 5'0" high makes this a pleasing room.

The location of the bed room is ideal for most people. It should be a little apart and yet easily reached. The bath room across the hall from all the rooms is exceptionally well arranged and lighted.

Closet space is well provided, and there being no attic, there can be no accumulation of "grandmother's things" kept from year to year and never used.

While not necessary in all climates, the architect has arranged for a basement. He has placed the refrigerator on the back porch, where it can be easily reached and can be readily drained.





# My Steel Square

## How I Use It In My Daily Work

*Dwight L. Stoddard*

OVER ten years ago when I wrote my Steel Square Pocket Book, I mentioned the fact in that book that the ordinary two foot square was too large and clumsy, and of course a good many others had realized that long before that, for they had for years been trying to invent a Folding Square, but it seems that they have practically given that up, but of late year they have given their attention more to the take down Square and in that they have made more success and come nearer getting a perfect tool that will stand the wear and tear.

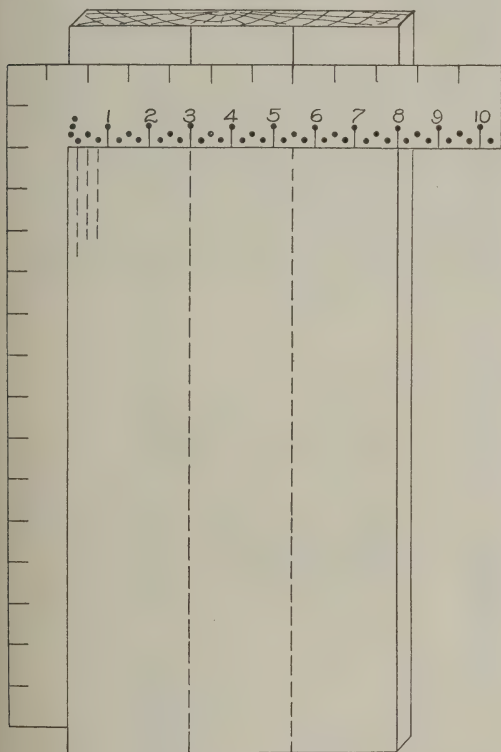
My Square that I mentioned about fixing by cutting off the tongue to 12 inches and making a 4-inch slot has been tried by many of the boys since and been found very convenient in a good many places. Now I still have that Square, and I have one of the very latest rust proof red squares 2 ft., blade 2 inches wide, 18 in. tongue,  $1\frac{3}{4}$  inches wide. It is a fine tool for heavy framing, but the majority of us carpenters do not do heavy framing now days any more. I have two of the very latest take down squares, and find them both good tools and very handy. They come nicely in cases, where they can be put away and kept nice for years, but in this day of rapidity and condensed kits of tools, there are a good many boys who don't want to stop every morning to take the square out of the case, put it together and lock it, and they don't want to spend much time after they get through work to hunt up the key, dig out the case, take the square apart and put it away. So all in all up to this day they have not entirely solved the problem. It is true we have little squares of different sizes that seems would suit some but they are too small and cheap to really take the place of a good square.

I want to tell how I cut my old two foot square down and made it the handiest all around square I ever used. Some might think they would rather cut theirs

down differently, but this way suits me the best. I will admit that it would be more like most squares if it had been cut down to 12-in. tongue and 16-in. blade, but I preferred to cut mine off to a 12-in. blade and I will tell you why. When laying off 16-in. centers I lay it off just the same as I would with a full two foot square, while if I wanted to make it 18-in. centers I would simply make a dot on the outer edge of my square and simply move over the blade to the other side to the dot, while if I wanted to lay off 14-in. I would simply mark at the inner side of the blade. For 12-in. center I use the 12-in. blade. Now I find this foot cut off this square does not cripple it in the least for getting pitches, degrees, length of rafters or any of their cuts for an ordinary roof. It is plenty big enough for any stair, and for casing beams, squaring base and all inside finishing it is a very handy size.

Now you will note by looking at the illustration, that I have not only cut a foot off the blade but I have put in 44 holes, that makes the tongue and blade almost exactly balance, so you can use the square equally as well one way as the other, for there is no heavy end to it, but that is not the reason I bored the holes. I put them in there every quarter of an inch for gauging, and to illustrate: supposing we had a board about 8 inches wide and wanted to rip a 3 inch wide piece and the other pieces into  $2\frac{1}{2}$  inches wide. Place your pencil into the 3 hole and into  $5\frac{1}{2}$  as illustrated. You will also note by the dots that I can gauge at every quarter of an inch. Should I have made holes so I could get every eighth of an inch it would take just as many again holes and every sixteenth, eighty more or over 160 holes. You will note the three little holes next to the tongue of the square, if I want to rip the piece  $1/16$  less than the full quarter I slip in a small nail about like a shingle nail and that holds the tongue off just the  $1/16$ , if I want it  $1/8$  less I put the nail in the middle hole and if I

want it  $\frac{3}{16}$  I put the nail in the other hole. So you see in that way with the aid of the nail I can get any thing from  $\frac{1}{16}$  up to  $10\frac{1}{2}$  inches. If I want to make a circle simply stick a nail for the center of the circle and hang the corner of the square around the nail and then place your pencil in whichever hole suits for the size of the circle wanted, swing it around and you have it, and as you use it in your daily work you will realize



A Square Cut Down and Drilled to Do a Good Variety of Work.

there is no end to the use that you can make of these little holes.

Now remember this square that I have fixed this way is a real square divided off into  $\frac{1}{10}$ ,  $\frac{1}{12}$ ,  $\frac{1}{32}$ , and one inch of it is divided off into one hundredths. It also has Brace measure and Octagon measure on the tongue and as that is not cut off it does not interfere with that at all. On the blade one side has board measure and the other side has rafter measurements, and while it is true some of those biggest measurements are cut off yet it does not really take very much away, for you take one that is left on just half the size of

what you want and double that and it is about as easy as to take the larger one.

Now don't understand me that I have solved the problem, and we shall do away entirely with our old two foot squares. Oh no, not by any means, for they will always be very handy in all the larger work and in heavy framing, yet in ninety-nine cases out of the hundred uses the average carpenter meets in his daily work, this smaller square will not only do it just as well but just a bit handier. The tool is almost perfectly balanced, easier to handle than the larger square, takes up less room in the kit, as it will go in an 11 inch box, is lighter and nicer in many ways.

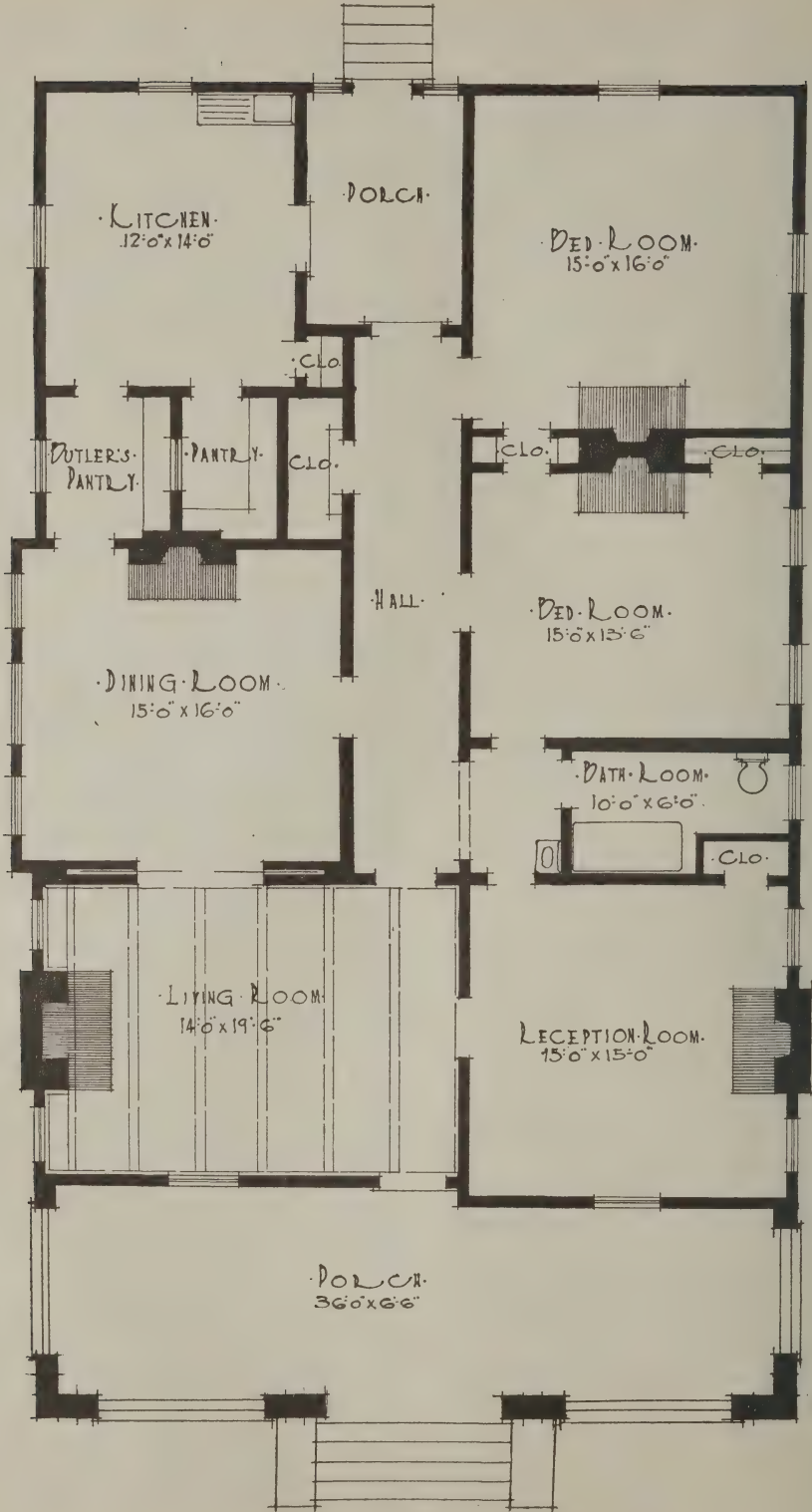
Practically all the hundreds of problems that can be solved on the two foot square can be solved on this smaller one.

The value of these little holes have been demonstrated many times in combination tools that have been placed on the market, but the trouble with most of those combination tools was that even if you could do a good many things with them as claimed, yet after all it did not do away with your other square but made you carry around just one more tool. The jobbing carpenter of today is doing every thing in his power to lighten and condense the kit that he has to take from job to job.

The big two foot square for heavy framing, the smaller square for inside trim, the most convenient large try square, the small try square for narrow flooring, etc., makes too many tools to carry around. These combination tools really never entirely took their place so one could well dispense with any of them, but this all-around square made out of an ordinary square, with a small light try square with a miter, does easily and handily every thing the average carpenter comes in contact with in his daily work, be he a regular carpenter, jobbing carpenter or any other kind of a carpenter.

Where a building contract contained the usual provision to the effect that all disputes as to the meaning of the specifications should be settled by the architects, it did not apply to a dispute as to extra work on adjacent property; that being outside the contract.—Alta Planing Mill Company, 138 P. (Cal.) 738.







A Bungalow Planned for Comfort and Good Appearance. Shaw Bros., Architects.

## As the Pendulum Swings

*Ben F. Cobb*

**I**T SEEMS as though ninety per cent of the houses that are being built this year are of the bungalow type. In fact, this style of house seems to be the fashion at this time, or perhaps we might say the craze.

Today's the day of the bungalow.  
Tomorrow that good style may go,  
And in its place, for all we know,  
Be less of comfort, more of show.

However, if, when the style does change, we should own as nice a home of the bungalow type as we show in this article, "Why worry?" For here we find, comfort, convenience and beauty.

Speaking of fashions in houses I am reminded that although new fashions in houses come in the old fashions never go out, and especially is this true of any accepted style of houses built from an architect's plans. The old New England farm house is picturesque and makes a delightful summer home, and the sight of the log cabin of America's early settlers sends a thrill through us that savors of patriotism and love of home. The colonial home of two hundred years ago is being

copied today and, no doubt, the bungalow will be built two hundred years hence, and still new fashions in houses will continue to come.

Although the houses of one or two centuries ago are being copied no one has yet had the hardihood to build them without the modern conveniences that we all so much appreciate. Sometimes I think these modern conveniences are not half as essential as we have made ourselves believe, and I do know that each and every one of them are a help in keeping up the high cost of living. However we like them just the same and after sleeping on a hair mattress and good springs for a while it is hard to go back to the soft side of a pine board, and it is not so easy to give up a private lavatory and go back to the tin wash basin out by the well. We must own there is a touch of the primitive in all of us, and the man who is born with a silver spoon in his mouth is the one who most enjoys camping out, with no more conveniences than the Indians have while the chap who never saw a bath tub until he was twenty-five is usually insulted



if asked to get along for a week without his private bath.

Slavery still exists in the United States, and has ever since society claimed the attention of the colonial dames. Not the slavery of the colored people as it was in the south, but a slavery to society and the chains are stronger than the ones the immortal Lincoln broke. I never see a very large house with its retinue of servants that I do not sigh for the sorrows of the woman who presides. To those who know no better she may be a leader in society with every thing at home that heart could wish, but to those who know, she is a slave with two masters, society and servants.

To me a real home is one that never has a servant in it, and that is why I appreciate so much the small conveniently planned houses that the NATIONAL BUILDER shows in its pages from month to month. The most of them are so arranged that a woman can do her own work and for real ease and comfort the woman who does her own work has the woman who has the care of from three to forty servants tied to the post. That looks like a race track expression, but if anyone has the idea that the society stunt is not a race let them try it awhile and find out their mistake.

I wonder if I would be allowed to dip into the servant question and not be called down by the editor, for all women, even in these small convenient houses, need a little assistance at times. In the first place servants are human beings. This may be news to some, and we are reminded that something must be radically wrong when a girl of foreign birth who cannot speak a word of English can command from seven to eight dollars a week for doing housework and have room and board furnished, while American girls choose to stand behind the counter all day for eight dollars a week and pay out most of what they earn for room and board. Is it false pride on the part of the girls, or lack of appreciation on the part of the employers? Perhaps it is a little of both, but whatever the trouble is it should be remedied.

I am convinced that the trouble does not altogether lie in the class of work that is being done, and as straws show which way the wind blows, let me remark in passing that the average office girl or

stenographer will not consider taking a situation if told that they must work under a woman.

House work and hard work are synonymous terms. One way to lighten the burden is to have a small house and not have any more furniture in it than necessary. A small house should mean small rooms, and a point worthy of notice is that a room twenty by thirty feet will catch double the dirt of one ten by fifteen, and a ten by fifteen room can be furnished for about one-third that it would cost to furnish the larger room. All of these points are worth thinking about when buying a home.

What people need more than anything else is a home-like home. An expression we often hear used is "a cozy home." A home-like, cozy home is not necessarily an expensive one. I have been through homes before now that had very large rooms which were expensively furnished and the only thing I could liken them to was an over grown barn just before haying time. There was grandeur and show of wealth but little that savored of home. Still those great barn-like houses are necessary, for while not home-like inside, they usually show a handsome exterior with grounds well laid out and several men are kept busy on the lawn and among the flower beds. When our friends come from some other town and from the country we take them in a hired auto and show them the sights, not the least of which are the beautiful residences of our city that the servants take care of nine months in a year, while the owners are traveling in Europe or some other place where they put up with more inconveniences than they would ever need to at home.

We are glad of the big houses for other people, but we love the little home-like home for ourselves. It is human nature when we are left to ourselves to get down near the ground. I know a successful lawyer who started out in life as a carpenter. He takes two months' vacation, and that two months he works at his trade in a town in Wisconsin where he first worked at it twenty years ago. Last year when he came back to take up his law practice he showed me his calloused hands and told me what a grand vacation he had enjoyed helping to build homes for other people.

# OUR READERS PAGES



[The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessarily for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experience will be given proper space.—Ed.]

## Answers

### STAIRS FOR SMALL COTTAGES.

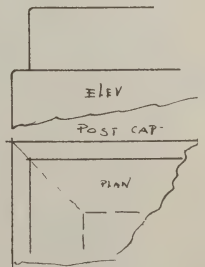
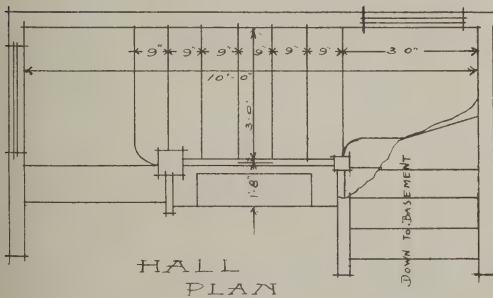
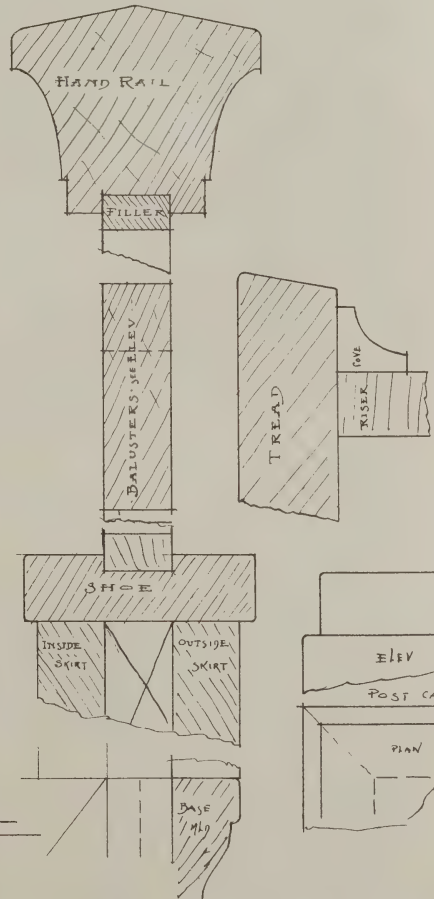
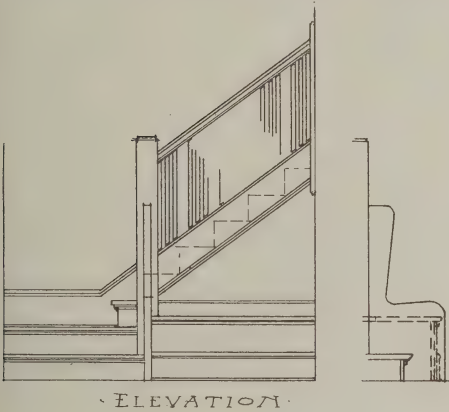
From B. T. A., Oregon:

I am enclosing plans, elevations and de-

### WANTS A SOUTHERN LOCATION

From G. MacK., Florida:

"C. R. B.," Minn., in your December



tails of a simple, plain stairway and trust it may be of use to "Young Chief."

issue of the NATIONAL BUILDER advertises being gulled before he got to Florida, gulled



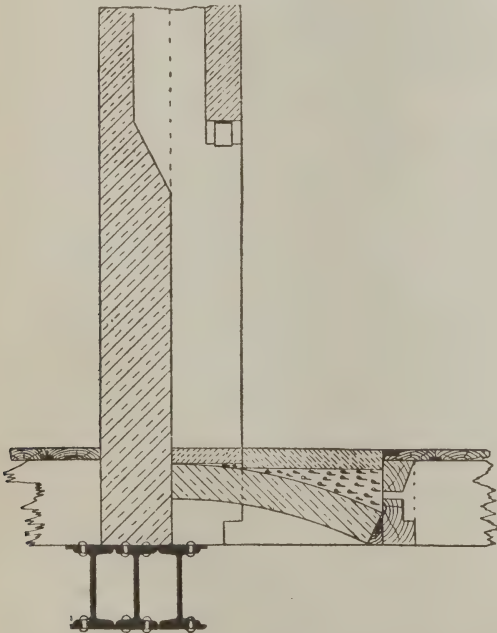
after he got to Florida and gulled after he left Florida, and inasmuch as he advertises that his chief object in his present position is to get something at the other fellow's expense, I think he is liable to be kept in the same happy condition.

His statement as to heat, health, hook worm and malaria in Florida is a revelation to those who know anything of Florida and its vital statistics. An experience of thirty years in Florida warrants the belief that if Florida was as free from such pestiferous, incapable grouches as this man advertises himself to be as it is from the troubles he recites, it would be a contractor's and mill man's paradise. Florida, however, is no sanitarium for the unwise, nor a nursery for the incapable, but wisdom, energy and capability will find its reward in Florida in all vocations as much if not more than in any state in the Union.

#### FIREPLACES.

From "Another Bricklayer," Wisconsin:

Replying to the Bricklayer, Kenosha, Wis. I submit the enclosed diagram



Fireplace in Wall Over Girders

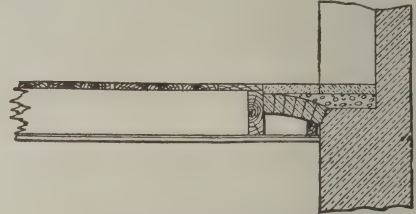
which I think will explain the whole work of building up a hearth, flue and mantel fireplace, over-wall, also trimming around the hearth in wood. The diagrams are

suited to almost any kind of domestic fire-place with mantel. They are self-explanatory.

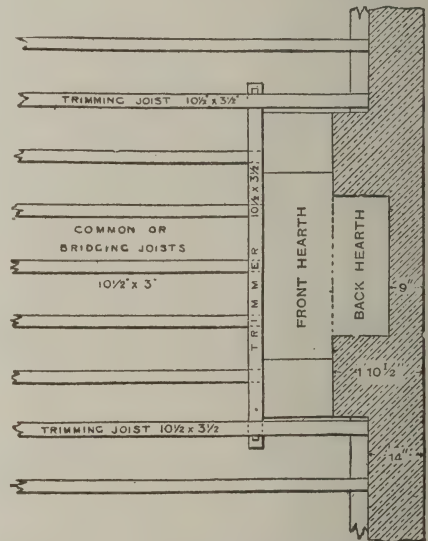
#### SLATE ROOFING

From "H. D. K.," Illinois, answering "B. D. C.," Michigan:

In slate roofing, the felt should be laid exactly the same whether roofing cement



Section through Trimmer Arch.



Plan of Fireplace Opening.

is used or not. The only thing to be careful of would be to put a little cement under the laps of the felt for the distance of three feet back. This will make an absolutely tight roof as far as the felt is concerned. It would also be well to cement the felt down to the valleys and other metal work.

Whether you use a cant strip depends upon the design of the roof and gutter. If you have a wide gutter, it might be well to put in a cant strip. Keep the slate well back from the bend in the gutter, increasing the distance as you get to the bottom. That is, if you start two inches back from

the bend at the top of the roof, the distance should be increased to three or four inches at the bottom.

In laying the slate, you will bed every slate as you lay them, the idea being to make a perfectly tight roof in case the gutter should overflow or come down so fast as to splash over on to the other side of the valley.

You will have to use plenty of cement and take a chance on its showing at the butts. If it does, it should be scraped off immediately, as it will be impossible to remove it if it gets dried out a little.

#### MORTAR COLORS.

From B. T. A., Oregon:

In reply to J. H. D. I have had success using the best Germantown lampblack to which I add about 20 per cent Princes Metallic. The red affects the black color only slightly and seems to make it hold color better.

#### ECHOES IN A SCHOOL ROOM.

From Old Sarbot, London:

In answer to H. F. G., Missouri, I should say the conditions according to the description of the building sent, are ideal for echo. Both the proportions and the materials of which the school room are built make for a really fine "ringing sound echo." However, let H. F. G. experiment with some old bags, canvas, or any old woven material, by draping them across the middle or other convenient part of the room, not less than one-third of the distance from either end, in the later case. Hang them across a rope or string very near to the ceiling and a little down the wall on each side. Let the part nearest the ceiling hang not less than two feet from the ceiling. It will probably be found that the echo is quite broken up, and if this is so, some decent material can be bought and arranged like curtains across the room in an ornamental manner. This is the cheapest, most economical and certainly the most effective way of doing the job and will save dollars on experiments of a structural nature which are more likely to end in failure.

#### CONCRETE PILES.

From "Jim McD.," Chicago, Ill.:

The following will perhaps fill the re-

quirements of the Milwaukee contractor. Where concrete piles are used, test piles shall be driven loaded under the general direction of the Commissioner of Buildings. The allowable compression of concrete piles shall not exceed 400 pounds per square inch at a section six feet from the surface of the ground in immediate contact with the pile. These tests shall conform to the following regulations: Tests shall be made on at least two piles in different locations and as directed by the Commissioner of the Buildings. Not less than three piles to be driven for each test. The pile to be loaded to be driven first, the second pile to be driven within six hours of the driving of the first, and the third pile to be driven within twenty to twenty-four hours after the first. The two latter shall each be driven centers, not to exceed twice the greatest diameter of pile, from the center of the test pile. The tests shall not be started until at least ten days after the piles to be loaded are driven, except that piles that have been cast and set up before driving may be tested as soon as practicable after driving. The piles should be loaded with twice the proposed carrying load of the piles. The settlement shall be measured until twenty-four hours shows no settlement. One-half of the test load shall be allowed for the carrying load, if the test shows no settlement for twenty-four hours and the total settlement has not exceeded one one-hundredths of an inch multiplied by the test load in tons.

#### SKELETON CONSTRUCTION

From "Wilcox, M. E.," Buffalo, N. Y.:

I herewith submit a portion of city by-law on this subject for the consideration of your correspondent, "Young Draftsman, Victoria, B. C." He will find this up to the mark. The term "Skeleton Construction" shall apply to all buildings wherein all external and internal loads and stresses are transmitted from the top of the building to the foundations by the skeleton or frame work of metal to reinforced concrete. In metal frame skeleton construction the beams and girders shall be riveted to each other at their respective junction points. If columns made of rolled iron or steel are used, their different parts shall be riveted to each other, and the beams and girders shall have riveted connections to unite



themselves with the columns. If cast iron columns are used, each successive column shall be bolted to the one below it by at least four bolts not less than  $\frac{3}{4}$  of an inch in diameter, and the beams and girders shall be bolted to the columns. Bolt holes in flanges for connection from column to column shall be drilled. At each line of floor or roof beams, lateral connections between the ends of the beams and girders shall be made in such a manner as to rigidly connect the beams and girders with each other in the direction of their length. All steel trusses shall be riveted and the steel work in buildings more than 100 ft. high and in a building whose height exceeds twice its width shall be riveted. Wherever it is found impossible to rivet connections as herein described, and such connections are bolted, cold rolled or turned bolts of exact fit and diameter in reamed holes may be used in place of rivets, with the same allowable stresses as field-driven rivets. All structural members which are temporarily bolted together shall be bolted in every alternate hole. After the basis or base plates and columns have been set in place, both shall be protected by a covering of cement or concrete applied direct to metal, measuring not less than  $2\frac{1}{2}$  inches thick from the extreme projection of the metal, filled solid in all spaces, and forming a continuous concrete mass from the grillage or other foundations to an elevation six feet above floor level nearest the column base plate or column stool. All metals shall be clean and shall be free from loose rust and scale, and all metal except that to be imbedded in concrete shall be protected with at least two coats of metal protecting paint. All structural details and workmanship shall be in

accordance with accepted engineering practice. All trusses shall be held rigidly in position, both temporarily and permanently by efficient lateral and sway bracing.

#### STORES.

From "Architects," Buffalo, N. Y.:

Builder of "Calgary, Sask."—You will get all the information required from the article I submit. Buildings containing stores only should have a separate service for each store. When gas service riser ends in rear of store an independent service should be extended to the front of basement. If there is no basement under building, Company must be notified so that the Gas Company service may be run before the floor is laid. Underground work by gas fitters between main meter will not be accepted. In flat buildings where appliances are installed for the joint use of tenants, such as laundry stoves, driers, etc., run pipe from each tenant's meter to laundry and provide a heater with a lock-cock for each tenant. Fasten securely to each cock a metal tag with the flat number plainly marked thereon. An opening for light in laundry may be taken from end of laundry header. Work must be proved with mercury gauge, not less than a six-inch column of mercury being allowed. It is the purpose of this Company strictly to enforce the above rules, and no certificate of inspection will be given when they are not complied with. Architects, builders, and owners of buildings are requested not to allow bill for gas fitting unless the Company buys a certificate of inspection.

## Questions

#### CLEANING EXTERIOR BRICK WORK

From N. F. A., Minneapolis, Minn.:

Can you please tell me what to use to clean smoke and dirt stains from exterior of brickwork, stone, terra cotta, etc.?

#### RE-LINING A CHIMNEY

From J. L., New York:

I am in search of the best method of lining inside of a brick chimney flue for furnace, 9"x9" square, 30 ft. long, without reducing the size too much, the mortar

joints inside are crumbling away. The job would have to be done from the top.

#### HAND SAWS

From "Young Mechanic," Great Falls, Mont.:

Will some reader of the NATIONAL BUILDER explain in detail how to put the best cutting points on a hand saw, and to take off the feather edge, also some general information as to size, make and quality to use?

## DRAWING.

From "Student," Detroit, Mich.:

I have been very much interested in your drawing lessons, but I have not been able to "Ketch-on" to everything in the lessons and would like a little more light on the rule showing the different methods of making drawings so that certain materials are represented. I will be obliged for further information.

## DOORS AND DOORWAYS.

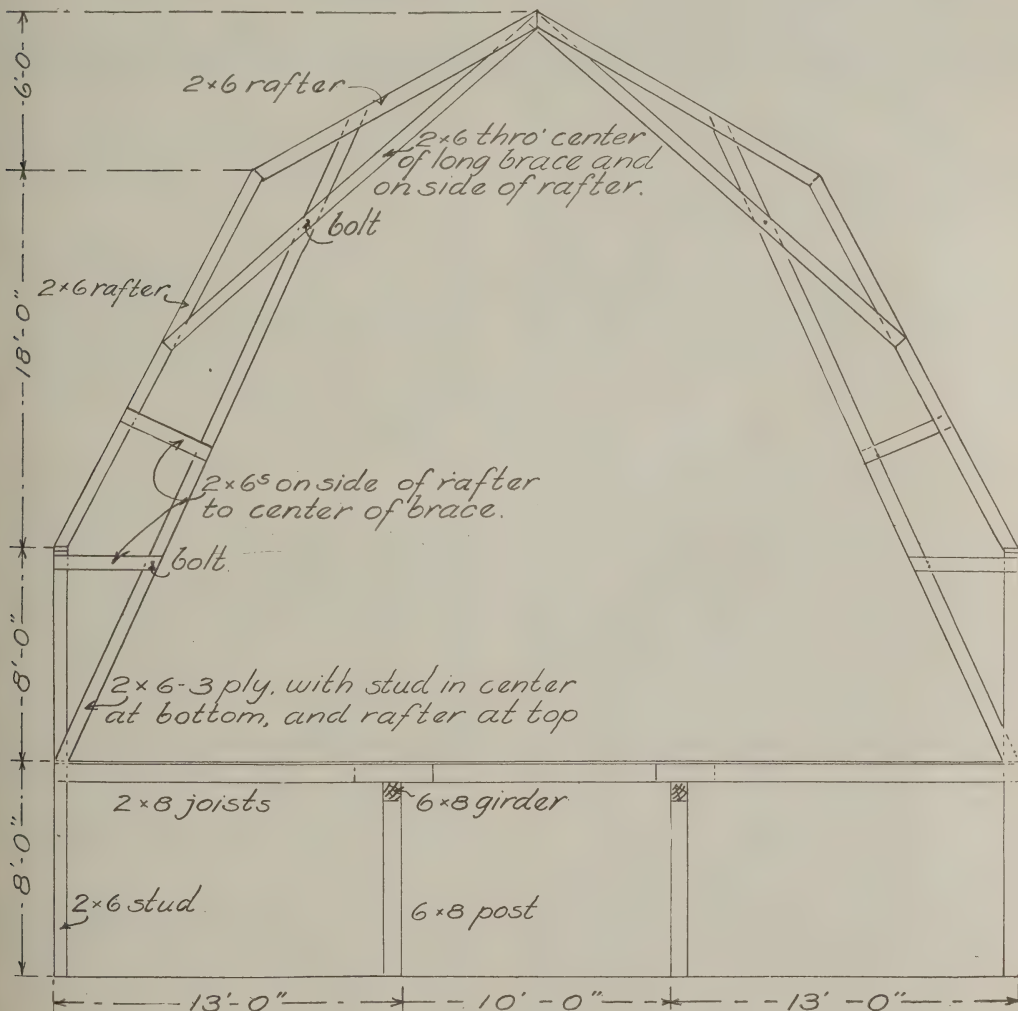
From "Workman," Calgary, Sask.:

Will some reader show a 6-panel door and a doorway and the manner of fitting it in a brick wall, and oblige?

## BARN FRAMING

From L. L. H., Iowa:

I should like to have the opinion of



## FIREPLACES, FLUES AND CHIMNEYS.

From "Bricklayer," Kenosha:

I am about to build a brick house which is to have eight fireplaces, with eight flues on to each, all of which discharge into one large chimney shaft. Can any one give me any pointers as to how I am to do this?

brother carpenters on this design for a barn truss. The barn is 36x72 ft. with a truss every 8 feet. The roof is boarded the same as for shingles, but is covered with Galvanized Iron Roofing. The sides are sheathed diagonally with 10" shiplap and covered with corrugated iron.





# LEGAL DECISIONS

OF INTEREST TO BUILDERS

*Prepared for the*  
NATIONAL BUILDER  
*by* George H. Murdock

The arbitration clause in a building contract does not authorize the architects to pass on the question whether they themselves were at fault.—*Reilly v. Rodef Sholem Congregation*, 90 A. (Pa.) 345.

An architect does not undertake that his plans will be perfect, and is liable, because of their not being so, only for failure to exercise reasonable skill in their preparation.—*Kortz v. Kimberlin*, 165 S. W. (Ky.) 654.

In an action for work, labor, and materials furnished in the reconstruction of a dumb-waiter shaft, plaintiff, who held himself out as competent and agreed to erect a shaft which would not be unlawful, erected it with two-inch blocks. At the close of the case plaintiff conceded "that the Tenement House Department requires that the outside of the dumb-waiter shaft shall be four-inch blocks." *Held*, that the concession was an admission that the rules of the Tenement House Department had not been complied with, and hence there can be no recovery.—*Bonagur v. Purificato*, 146 N. Y. S. 1070.

Plaintiff, for a specified price, agreed to do certain work, including plastering, in the alteration of a building, pursuant to a subcontract, in accordance with certain specifications, one of which referred to from the main contract was entitled "Finishing walls," and provided, "Allow \$600 for finishing wall in 2, 3, and 5, this allowance not to include the plaster cornice, which is included under 'cornices.'" *Held*, that the subcontractor was not bound by any portion of the specifications merely referring to the amount of payment to be made by the owner, and, not having fin-

ished the walls, was not required to deduct \$600 from his contract price under such provision.—*Martin v. Oberle*, 147 N. Y. S. 60.

In a building contractor's action, the burden was on it to establish the amount of its claim for extras, and, in the absence of complete and accurate data, it could not derive any advantage from the lack of definiteness in the proof of its claim.—*Isaac Sherman Company v. Champlin*, 89 A. (R. I.) 504.

Under a contract whereby defendant was to build and equip and lease a theater building to plaintiff, providing that it should be equipped in accordance with specifications which, in fact, were prepared as the work progressed, the architect's failure to prepare complete specifications of equipment such as fixtures and decorations, which were the last things done in completing the building, did not relieve defendant from his obligation to furnish such items of equipment as were shown to be usual and necessary.—*Orpheus Vaudeville Company v. Clayton Investment Company*, 140 P. (Utah) 653.

Under a contract for the construction and lease of a theater building, providing that defendant should completely equip it in accordance with the architect's specifications to be approved by plaintiff, where neither the contract nor the architect specified what should constitute the equipment, evidence of qualified witnesses that an asbestos curtain, a ticket office, a brass rail for such office, a gridiron, and rigging loft, chairs, and decorations for ceiling and walls were usual and necessary parts of the equipment was admissible.—*Orpheus*

Vaudeville Company v. Clayton Investment Company, 140 P. (Utah) 653.

A provision in a building contract whereby the contractor assumed all responsibility for damages occurring to any adjoining building by any act or omission of himself or employes did not render him liable for the expense of underpinning an adjoining house.—*Alta Planing Mill Company v. Garland*, 138 P. (Cal.) 738.

In a building contractor's action for the amount due under the contract and for extras, it appeared that certain items in the specifications were by agreement taken out of the contract, the owner agreeing to provide for the performance of the work as to such items, but that he purchased materials therefor from the contractor and employed them to do a part of the work. On one of such items the owner saved about five per cent. over the price stated in the specifications by doing the work himself. As to two other items included in the specifications at \$4,361, which amount

was deducted from the contract price, it appeared that he paid a third person \$2,300 for labor. *Held* that, although there was no evidence showing separately the value of the labor and materials furnished by the contractor for such items, it would not be unfair to the owner to allow the contractor such an amount therefor as, with the amount paid such third person, would allow the owner a saving of five per cent. of the price stated in the specifications.—*Isaac Sherman Company v. Champlin*, 89 A. (R. I.) 504.

Where a contract for alterations in a building, according to plans, provided that alterations in, additions to, or deviations or omissions from, the work contracted for might be made during its progress without annulling or invalidating the contract, and changes were made under such provision, proof that plaintiff did the work in the changed form amounted to proof of performance of the contract.—*Fox v. Fox*, 145 N. Y. S. (N. Y.) 949.

## Book Notices

Notice—All books noticed in these columns may be obtained from this office at publishers' prices. All postage or express prepaid. (Money and address must accompany all orders.)

**CALIFORNIA BUNGALOW HOUSES:** Published by the Bungalowcraft Company, Chamber of Commerce, Los Angeles, California. Paper covers, price post paid, \$1.00. This is a very nicely gotten up work, and contains a large number of plans and elevations of Bungalows that have been specially prepared for the mild climate of the Pacific coast. They are also suitable for the Middle States and Canada. Most of the plans and elevations shown are very pretty and conveniently laid out and indeed some of them are very happily contrived and are models of ingenious planning. For those intending to build a Bungalow next, or any future year, this application will prove a great help as there are many things essential in Bungalow planning and building in it the lay mind would likely over-look.

**ARCHITECT-TONICS:** The Tales of Tom Thumtack, architect. New York, the Wm. T. Comstock Company. Cloth, illuminated, 5 by 7", 175 pages, 100 illustrations. Price \$1.50 net.

This is not a technical book, or an instructor of Architecture, but is rather a book of The Humor of the Profession, and is well worth reading. This is the time that architects can claim to have recognized literature in the field of fiction. We have stories about millionaires, manufacturers, all kinds of business men, farmers and quite a little about engineers, but never a word about an architect. Here it is and it is represented with all the taste that an architect is supposed to have. The book is designed from beginning to end, from the gorgeous illuminations of the cover, the book plate, the frontispiece and title done in colors, and the many illustrations of the stories which fit the point and tell the tale, there is evidenced a fine workmanship that is unusual in fictional literature. These are a series of tales about the experiences of an architect. They tell his views of life in little stories, about the things which happen when buildings are built, lived in and torn down, the tales of the office, and the architect's views of the client. There is humor and fun and



pathos. They are little tales from life, and they are told briskly and with light-heartedness. Nothing since the days of Cruikshank has equaled the cleverness of the illustrative sketches. The book will furnish recreation for many besides the professional man, and every one who knows an architect ought to have a copy just to acquaint himself more fully with the species. The book is handsomely bound and will make a fine Christmas gift for the "boys."

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**THE PRACTICAL BOOK OF GARDEN ARCHITECTURE.** By Phebe Westcott Humphreys. A book for the owner developing his property, large or small; for the owner employing a professional garden architect, and for the artist, amateur, student and garden lover.

Aside from enunciating the principles governing Eminent Practicability, the Best Taste and General Usefulness, the volume contains one hundred and twenty-five illustrations, showing actual examples of Garden Architecture, House Surroundings and examples where the fullest advantage has been taken of natural and artificial landscape and garden features. The owner of a property is vitally interested in this subject, and should know the principles at least while the student is just as much concerned in seeing the results which others have achieved.

Gardening is an elastic term, embracing, as it does in this case, a wide range from gateways, walks and entrances, to the elaboration of the most extensive estates. The author has been especially fortunate in the wide range of subjects which are shown.

Published in their usual good style by J. B. Lippincott Co., Philadelphia and London. Price, postpaid in U. S. A., \$5.00.

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**GAS, GASOLINE AND OIL ENGINES.** By Gardner D. Hiscox, M. E., and Victor W. Page, M. E. This is a revised edition of what was a most complete treatise on modern explosive motor design construction, management and application. The man who rides in the car realizes little of the work of designing and building the smooth-running motor, although he may know something of its care. Here the various styles are shown, many from the original drawings, but all so arranged that there is no difficulty understanding both drawings

and text. The practical man will appreciate the directness of the whole, and the absence of abstruse theory, unnecessary to the scientist and confusing to the mechanic.

The book will be of value to the mechanic who would be posted in his own engine, as well as other styles, to the salesman who must talk intelligently and instruct his customers. The more knowledge he has the more valuable he is to his employer.

The Deisel engine, which seems destined to be widely used in the near future is discussed very completely, as well as other forms using the cheaper grades of fuel. The book should have a large sale among the thinking and studying men who are interested in motors and machinery generally.

There are some 640 pages with folding plates and 455 illustrations. The price is \$2.75 postpaid.

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**STEEL CONSTRUCTION:** A Reference Book for Architects, Civil Engineers, Designers, etc., and a Text-Book for Students. By Henry Jackson Burt, C. E., Structural Engineer for Holabird & Roche, Architects; members of American Society of Civil Engineers, member Society for the Promotion of Engineering Education. Published by the American Technical Society, Chicago. Price \$2.75.

There is a satisfaction in designing a building and seeing it grow. There is also a certain amount of curiosity as to how the various members are designed, fabricated and erected. Knowledge regarding the material is also pertinent to everyone interested in any phase of building construction.

The author gives some pace to the manufacture of structural steel and iron before getting into the elements of design, after which the subject is taken up in the most practical manner. After 268 pages of practical general work, the design of a specific building, viz.: a sixteen-story fireproof hotel is taken up in detail, thus giving the reader or the student a close insight into the methods by which the theory is applied.

The 236 drawings and photographs were made especially for this work and they are exceptionally pertinent to the 400 pages of text. A great deal of useful information which could only be gained by one actively engaged on the actual buildings, is given in the book. In all it will be a most useful book for those for whom it is intended.

# Opportunity for Contractors

*Watchful waiting does not develop business*

Get into the habit of going after business, of asking for it. That habit has made the world's commerce. The big merchant is proud, not ashamed, of his habit of asking for business.

**Suggest to your customers that they order Maple, Beech or Birch Floors put in this winter**

Scores of residences and business structures in your community need new floors and in many cases a suggestion from you will bring an order.

When you put in Maple, Beech or Birch floors, you are giving your customers the best looking and the most durable floor. It is a business from which your customers derive satisfaction and you derive profit.



Maple, Beech and Birch floors improve the appearance and increase the value of a building. They lighten the work of the housekeeper.

Putting in these floors will make the winter profitable to you and the work will be more than satisfactory to your customers.

Send for your copy of "More Work for the Winter," which contains instructions for getting the flooring business

**Maple Flooring Manufacturers' Association**  
**Stock Exchange Bldg. - - Chicago, Illinois**

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



# Boston Prices For Lumber

	SPRUCE	L. L. Y. P.	S. L. Y. P.
2 x2—2x2½—2x3—2x4	} 20 ft. & under. \$30.00		
2½x4—3x4—2x6—2x7			
2 x8—3x6—3x7—3x8—4x6—4x8			
2x 9—3x 9—4x 9		31.00	
2x10—3x10—4x10		32.00	
2x12—3x12	}		
4x12—6x12—8x12—10x12—12x12		33.00	
14-inch			
16-inch			
"Squares"			
6x 6—6x 8—8x8	30.00	30.00	Up to 28 feet. 30.00
8x10—10x10	32.00	34.00	Up to 28 feet. 34.00

Note:—\$1.00 extra for each 2 ft. over 20 ft.

¾-in. and 1¼-in. white pine cornice, sound knotted.	55.00
¾-in. and 1¼-in. cypress cornice, clear.	60.00
¾-in. and 1¼-in. cypress cornice, select.	50.00
6-in. red cedar or redwood bevel siding, clear, 8 to 16 feet.	30.00
6-in. white pine, clear, 12 to 16 feet.	45.00
6-in. white pine, No. 2, 12 to 16 feet.	40.00

## ROOFING, T. & G., SHIP-LAP OR SQUARE EDGE.

¾x5½-in. face, N. C. pine, 10 to 16 feet.	26.00
¾x7½-in. face, N. C. pine, 10 to 16 feet.	23.00
¾x9½-in. face, N. C. pine, 10 to 16 feet.	28.00
1¼x5½-in. face, N. C. pine, 10 to 16 feet.	30.00
¾x5½ to 7½-in. spruce.	30.00
¾x5½ to 7½-in. hemlock.	26.00

## FLOORING.

¾x2½ to 4½-in. N. C. pine, or yellow pine, flat grain, No. 1, 10 to 16 feet.	35.00
¾x2½ to 4½-in. N. C. pine, or yellow pine, flat grain, No. 2, 10 to 16 feet.	30.00
¾x2½ to 4½-in. N. C. pine, or yellow pine, flat grain, No. 3, 10 to 16 feet.	24.00
¾x2½-in. N. C. pine, comb grain, No. 1, 10 to 16 feet.	47.00
¾x2½-in. N. C. pine, comb grain, No. 1, 10 to 16 feet.	38.00
¾x2½-in. yellow pine, comb grain, "A Heart," 10 to 16 feet.	75.00
¾x2½-in. yellow pine, comb grain, "A Sap," 10 to 16 feet.	55.00
¾-in. maple flooring, 2 feet and up, clear.	60.00
¾-in. maple flooring, 2 feet and up, No. 1.	55.00
¾-in. plain oak flooring, 2 feet and up, clear.	75.00
¾-in. plain oak flooring, 2 feet and up, selects.	65.00
¾-in. quartered oak flooring, 2 feet and up, clear.	115.00

## SHINGLES

18-in. red cedar, "Eureka"	5.00
18-in. white cedar, XXXX.	7.00
18-in. white cedar, clear butt	6.00
16-in. white cedar, extra	4.50
16-in. white cedar, clear butt	4.25
6x18-in. cypress, No. 1, Heart (on 6-in. basis)	11.00
6x18-in. cypress, No. 1, Sap or "A" (on 6-in. basis)	9.00
6x20-in. cypress, No. 1, Heart (on 6-in. basis)	14.00
6x20-in. silver gray cedar, No. 1 (on 6-in. basis)	18.00
6x20-in. silver gray cedar, "A" (on 6-in. basis)	15.00

## CEILING.

½-in. N. C. pine ceiling, clear, one side, 10 to 16	30.00
½-in. N. C. pine ceiling, No. 2, one side, 10 to 16	24.00
¾-in. N. C. pine ceiling, clear, one side, 10 to 16	30.00
¾-in. N. C. pine ceiling, clear, one side, 10 to 16	35.00
¾-in. N. C. pine ceiling, clear, two sides, 10 to 16	40.00
1½-in. N. C. pine ceiling, clear, one side, 10 to 16	37.50
1½-in. N. C. pine ceiling, clear, two sides, 10 to 16	40.00

	C.Y.P.	Y.P.	W.P.
4¼-in. moulded casing	\$2.75	\$2.25	\$3.30
4¾-in. moulded base	3.00	2.50	3.75

## SLATE.

Sea green, No. 1	\$4.10 to	4.50
Bangor, No. 1	4.75 to	6.25
Peach bottom, No. 1	5.10 to	5.35

NOTE.—These prices are for less than car lots delivered on the job, within reasonable limits in Boston and the adjoining districts.



# You bet it's a Happy New Year

—say H-L-F Carpenters and  
Contractors.

Made double profits on last year's jobs. Besides the regular profit, we made another, just as big, by buying better materials for less money from H-L-F

H-L-F lumber was so clean and straight that it was a pleasure to use it and the owners were all delighted.

More jobs lined up for spring, than ever before.

## Our best New Year's Greeting to you, is

### Tie up with H-L-F and doubled profits

Hundreds of carpenters and contractors are looking back over 1914 and rubbing their hands with pleasure. They made more money than ever before in 1914 because they bought their materials of H-L-F.

Make up your mind *right now*, to double *your* profit for 1915. Get out of the rut. Don't be satisfied to pay the dealer his exorbitant prices on lumber—or take the stuff he has on hand, whether the quality is right or not.

Come right to headquarters—buy of H-L-F, the *producers*—put the dealers' profit in *your* pocket—put better lumber into your buildings—make the owner better pleased—make more money and get more jobs.

### Start the New Year right by getting H-L-F prices NOW

Send us the bills of materials you're figuring for spring jobs—get our freight-paid price. You'll be amazed at the lowness of our prices for winter and early spring delivery.

### Use the coupon

Send for the H-L-F Prize Plan Book—the H-L-F Barn Builder's Guide—ask for some H-L-F Plan Sheets, so we can help you work out house plans if you want us to—ask for the H-L-F House Pricer, which enables you to get the H-L-F price quick, without making up bill of materials—ask also for the H-L-F Silo Folder, and the H-L-F Millwork Catalog

**Fill out and send the  
coupon today**

### Hewitt-Lea-Funck Company

Capital \$1,000,000  
Not in any trust or combine  
509 Crary Building  
Seattle • Wash.

### Hewitt-Lea-Funck Co.

509 Crary Building, Seattle, Wash.

Gentlemen Please send me the following

- ☐ Delivered freight-paid price on enclosed list of materials (no charges).  
☐ H-L-F House Pricer (Free) ☐ Plan Sheet (Free)  
☐ Information on H-L-F Stud and Wall Board Construction  
☐ Prize Plan Book (send 10 cents) ☐ Barn Builder's Guide (send 4 cents)  
☐ H-L-F Silo Folder (Free) ☐ Millwork Catalog (Free)  
☐ Freight-paid price H-L-F Silo Diameter \_\_\_\_\_ ft Height \_\_\_\_\_ ft.

Name \_\_\_\_\_

Street or R F D No. \_\_\_\_\_

Post Office \_\_\_\_\_

State \_\_\_\_\_

Business \_\_\_\_\_

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WRITE TO ADVER-



ON LETTERS YOU  
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# Advertisers' Symposium

Manufacturers of woodworking machinery and carpenter's equipment are this month sending a message to our readers. The various letters which follow indicate

the prospect of good times which will unquestionably be with us in the very near future. There is a personal message for each one in these letters.

## W. F. & John Barnes Co. Rockford, Ill.

To the readers of the NATIONAL BUILDER we extend our Holiday Greetings.

You all remember us; we are the firm that advertises the man behind the Scroll Saw. For thirty-five years we have been before the public and in those years we have made thirty-five thousand machines; and back of them, we have thousands of friends whose pleasant words have made it possible for us to build the largest line of foot power wood working machines on the market.

You old readers started the contracting game when the work shop was "under your hat"; your profits were all made by hand and when the Barnes machines were recommended you bought one for trial; it did its work and you bought more; built your shop and by your good judgment and Barnes Machines were soon making money and good money on every job.

We are today making these machines and our customers are still making money.

We have customers using our machines in every corner of the world; in fact the Barnes machines are used by missionaries who are educating the heathen in foreign lands. This only shows that good goods travel fast and far and they will continue to do so as long as we hold to the quality, material and workmanship.

We like to write about our machines so send for our Wood Working catalogue and let us solicit your orders. By buying at once you will have the opportunity of increasing your profits for 1915 and make it the banner year in your business.

Again wishing you the compliments of the season, we are

Very truly yours,  
W. F. & JOHN BARNES CO.

## The Silver Mfg. Co. 340 Broadway, Salem, Ohio

NEW YEAR'S GREETINGS, NEIGHBOR:

Now how are you going to equip it?

Your shop or plant may be worth \$500 or it may be worth \$500,000. But to YOU it's just about the biggest thing on earth. And right now, on the threshold of a brand new year full of vast possibilities for expansion, you are, of course, brimming with real red-blooded American optimism. Is it to be a new shop, or additions, or new equipment, or a single machine?

And how *ARE* you going to equip it?

Well, we've been at it now for 61 years—started back in '54 just where our big factory now stands—

And, answering that question from our own experience, we can make a pretty good guess that you've decided—

—to watch the corners—to buy every piece of your new equipment for *REAL SERVICE*—and to make every penny invested count for all that's in it.

Now, of course, we can't place Silver's tools in your plant without *YOUR* consent.

And, you can't *DECIDE* about Silver's tools—their utility—their place in your shop plans—their low price—until you have our catalog at your elbow.

Writing and mailing a postal card today—now—will simply put you where you can decide intelligently. In the return mail our catalog will arrive—for use when you

Advertisers' Section.

## Screw Holes That Hold

Don't put screws in wood—the thread in the hole wears out and the hole has to be plugged.

Use *Stine* Screw Holes, made of brass, driven into the wood. Will hold the screws tight everlastingly.

Furnished in all sizes for all kinds of work—wood, glass, marble, plaster of paris, stucco, cement and all kinds of metals.

Samples free to architects, contractors and dealers. Write today.

**STINE SCREW HOLES COMPANY**  
Corner Main and North Decatur, Ill.

PASTE THIS DOME  
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ON LETTERS YOU  
TISERS. IT HELPS.



*The Above Dairy Barn is Located on the Farm of the Eastern Illinois State Hospital for the Insane at Kankakee, Ill. All Material in its Construction was Chosen for its Strength, Sanitation, Safety and Economy*

## This Model Dairy Barn Is Roofed With **GIANT FLEX-A-TILE** Asphalt Shingles

Heppes Giant Flex-A-Tile Asphalt Shingles were selected as the one and only suitable roofing material for the model dairy barn pictured above. By every test, Heppes Giant Flex-A-Tile Asphalt Shingles prove their strength, their durability, their lasting weather-proof quality.

Whether on a big roof surface like the above—or on the smallest cottage, Giant Flex-A-Tile Asphalt Shingles are always the most serviceable and economical. Sturdy, stiff and fadeless, they are the best buy for

the money as well as the best that money can buy.

By actual measurement, Heppes "Giant" Flex-A-Tile Asphalt Shingles are 50% heavier, 80% bigger and 100% stronger than any asphalt shingles ever made.

**Write Today For Specimen Shingle  
and Complete Information**

*Learn for yourself what remarkable shingles Flex-A-Tiles really are. Write today and ask us to send you complete information and specimen "Giant" Flex-A-Tile.*

# The Heppes Company

*Manufacturers also of Asphalt Paint, Asphalt Roofing in any Finish, Utility Wall Board*

**1012 So. Kilbourne Avenue**

**Chicago, Illinois**

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ON LETTERS YOU  
TISERS. IT HELPS.



get to it. You will find our advertisement on another page in this issue.

Thirty seconds right now will do the trick.

Cordially yours,

THE SILVER MFG. CO.

By Wm. L. Wright, Adv. Mgr.

### **The Sidney Tool Co.**

Sidney, Ohio

We desire to extend to the readers of the NATIONAL BUILDER our very best wishes for a Happy and Prosperous New Year. All indications seem to point to a decided improvement in trade conditions in 1915, and as we have explicit faith in this great country of ours, we are preparing to take care of a "Rush" business.

We wish also to take this opportunity of calling your attention to the many advantages offered in the Famous line. This line includes nearly any type of individual or separate machine, (as well as the greatest variety of Universal woodworkers on the market) required for the wood-working shop.

The Famous line offers the buyer a choice of four sizes and ten styles of band saws, eight sizes and styles of saw benches for all varieties of work, eleven types and sizes of swing cut-off saws, and jointers in four sizes, with pony planer attachments, single and double spindle shaper, three sizes and two styles of pony planers, vertical hollow chisel mortiser in combination, mortiser and tenoners, three sizes of post borers, lathes, in four sizes for wood turning and five sizes for pattern makers.

In addition to the above, we offer a choice of one of fifty-four distinct and separate combinations of universal woodworkers. The Famous line of Universal machines is the largest line and most extensive on the market. We are pioneers in the manufacture of this type of machine and have over 3,000 working today. All machinery built here in our own factory, and everything tested out with actual work and every machine guaranteed for life, to be free from defective material or workmanship.

We are specializing on motor driven equipments, and can equip any machine in the Famous line with individual motor drive, either in single or polyphase alternating or direct current motors. We also fit

our woodworkers with individual gas engine drive.

We invite you to investigate us and to investigate the Famous line, by asking for our neat little catalog of 128 pages, which contains complete illustrations and descriptions of each machine as well as other useful information for woodworkers, and it shall be a pleasure for us to mail you this book without cost at your request. Ask for catalog No. 18.

THE SIDNEY TOOL CO.

### **M. L. Schluter**

225-227 W. Illinois St., Chicago, Ill.

Have you heard of M. L. Schluter's Floor-Surfacing Machines? They are worth your attention. Let us tell you something about them.

The "Rapid," for use on wood floors, is made in four sizes, suitable to work of any description, while the "Wizard" is built along the same lines, but is for surfacing and polishing stone, tile, parquet and composition floors. This Machine is our latest product, and in these days of tile and mosaic floors, presents wonderful possibilities to the Contractor and Builder.

Our Machines are so simple of construction that they can be operated by a child, but any one of them, even the "Baby Floor Surfer," will do the work of several men, and do it satisfactorily, as has been proven in hundreds of cases.

Instead of the tedious process of men scraping by hand, put one of our "Rapid" Machines on your wood floor, and see how white and smooth it becomes in a very short time, with slight labor and at small expense.

As for the "Wizard," by means of carborundum discs which revolve in opposite directions, a tile floor can be made as smooth as enamel. This Machine has a controlling handle which makes it most easy to govern, and only a trial of it will give you an idea of its efficiency and vast possibilities.

You can have a personal trial of any one of our Machines, and we will be glad to write you full regarding our Trial Offer, etc., upon your request.

We extend to all the Season's Greetings, with the sincere wish that the New Year will bring Peace and unlimited Prosperity.

M. L. SCHLUTER.



**QUICKER SERVICE—  
BIGGER PROFITS—  
BETTER GOODS—**

# Make Me Prove It!

I WANT to show you how you can increase your profits. All I want you to do, Mr. Contractor, Mr. Carpenter, Mr. Builder, is to send me the coupon—or a post card—for our catalog. I will send it to you—anywhere—and write you at the same time. The fact that

**WE SERVE 10,000 Contractors,  
Carpenters and Builders Regularly**

demonstrates that our service and material is **right** and that we are making money for them. We are. And we can make it for you, too. Make me deliver the proof. I can.

## Satisfaction or Money Back

Remember, every single one of the entire 5,000 items in our catalog is sold under our famous legal binding guarantee. We guarantee our quality to be the very highest. We guarantee prompt and safe delivery to you—anywhere; it makes no difference where you live. And we guarantee absolute satisfaction or refund your money. You are the sole judge. There is no argument. Our estimates are "Guaranteed Right." Try us for the proof.

## We Ship to You Anywhere

No matter where you live, we guarantee safe and prompt delivery. We have customers everywhere. Our plant is the largest in the world. We sell everywhere on earth. Our own architectural staff will work up your plans from your own rough sketches. The cost is but a fraction of what you would have to pay locally. For

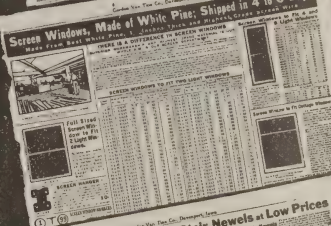
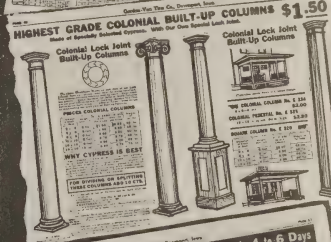
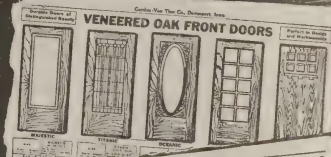
every nickel in freight, we will save you dollars on the bill. I want to tell you more about this when I write you.

## 5000 Building Bargain Get Catalog **FREE** Use Coupon

Here are a few pages from our 132-page color illustrated catalog of 5,000 Extraordinary Bargains in Building Material. Lumber at a saving of \$100 to \$300 a car. Millwork in special designs for immediate shipment. No waits. Roofing, Builders' Hardware, Paints, Wall Board, Everything! Crammed from cover to cover with money-savers. A veritable Builders' Encyclopedia. The book that creates low prices. Free on request. I want to send it to you. Will you use the coupon? Or a post card? I have started 10,000 others to greater profits by sending it to them. Let me start you. Today! Now!

WM. RIORDON,  
Mgr. Contractors' Dept.

**GORDON-VAN TINE COMPANY**  
744 Federal Street - Davenport, Iowa



Gordon-Van Tine Co., 744 Federal St., Davenport, Iowa

Gentlemen:—Please send books checked below.

..... Millwork ..... Plan Book  
..... Roofing ..... Circular & Samples ..... Lumber

Name.....

Address.....

Occupation.....

In sending for Plan Book, enclose 10c for postage and mailing. You receive books by return mail.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



**Oshkosh Mfg. Co.**

414 S. Main St., Oshkosh, Wis.

## GREETINGS:

The Oshkosh Manufacturing Co., makers of Oshkosh "Eveready" Saw Rigs and Oshkosh Mixers, take this opportunity to wish all their customers, friends and the readers of the NATIONAL BUILDER a Merry and Bounteous Christmas and a New Year of greater prosperity than they have yet known.

That 1915 will be a prosperous year for those contractors who use the "Eveready" Saw Rig and the Oshkosh Mixer, is a foregone conclusion. Building operations for 1915 promise to be more extensive than they have been for many years. With these two time, labor and money saving machines, contractors will be able to bid low, get the business and still make as much—and probably more—profit than the contractor who bid the highest would have made, had he got the job.

The Oshkosh "Eveready" Saw Rig saves the wages of six men, because it does all the work that it would require these men to do by antiquated hand methods. Think of the wide range of its usefulness! This mechanical masterpiece will not only cross-cut and rip-saw, but joints, sands, jig-saws, grooves, bores, mitres and also grinds tools. Every attachment for an "Eveready" goes with each machine—you don't buy a single extra of any kind.

Despite the fact that the "Eveready" is built heavy and strong to stand up under a life-time of hard service, it is yet light enough for two men to move it easily. It needs no skilled labor to operate, for simplicity is the keynote of its construction. The engine is guaranteed to deliver over 4 actual brake H. P.—it is an engine with *real* power, always ready for work no matter what the weather conditions are.

As a money making mate to the "Eveready" Saw Rig, the Oshkosh Mixer can't be beat. It has proved itself the best mixer in tests under actual working conditions in various classes of work. With this machine, a common laborer can get perfect results, producing a smooth, well-blended mix. There are few parts—the machine is simple yet efficient. Loads and cleans easily, mixes any material and requires little power. Can be had for gasoline, steam or electric power.

We want every contractor to have a copy of our Contractor's Equipment book. It is a veritable encyclopedia on contracting for profit. A copy is yours free. Here's our address—write for a book today.

OSHKOSH MANUFACTURING Co.

**The Alexander V. Milburn Co.**

Baltimore, Md.

LIGHTING PLANTS A PROFITABLE SIDE LINE  
FOR BUILDERS

At this season of the year when active construction operations are beginning to slacken for the winter, a great many builders are turning their attention to side lines directly related to their business and affording good profits for spare time. Work of this kind on some good agency for building equipment makes the busy season of the builder last all the year round.

There is no better side line to be secured than lighting plants for country homes. Good light and convenience in cooking are comforts that every home desires, and an opportunity is presented to make sales and installations in old houses as well as new ones. In figuring on spring contracts for building, there is an excellent opportunity to introduce a gas plant.

The Milburn Homegas Plant, manufactured by the Alexander Milburn Company of Baltimore, Md., is an excellent equipment to handle on an agency basis. It is made in a variety of sizes, such that every home, no matter how small or how large, may be equipped. It provides for capacities as low as 16 lights. It is also built in units so that if extensions are desired after the first installation, they may be effected simply by adding additional units. These plants generate acetylene gas, which gives a light now generally recognized as being the most natural, easy and healthful one obtainable. In addition, this gas gives the advantage of cooking with gas.

These plants may be handled by contractors and builders on a commission plan, which offers a very attractive margin of profit to the progressive, energetic man.

**C. H. & E. Manufacturing Co., Inc.**

Clinton and Mineral Sts., Milwaukee, Wis.

Were the inside history of any successful business to be written up, it would be found that it has grown, at times, almost without the conscious effort of the proprietors. A

**Lumber used for exterior work should be reasonably soft, of firm texture, free of pitch, so it may be worked with ease and nailed without injury, and of a character to take and hold paint.**

That definition of the ideal outdoor wood effectively and minutely describes *Arkansas Soft Pine*.

No other wood on the market gives the builder greater value for the money he invests than is secured by the use of *Arkansas Soft Pine*.

No other wood gives the contractor greater satisfaction or enables him to produce a better structure.



Siding, window frames, porch ceiling, columns and floors are of Arkansas Soft Pine.

The builder of this home used Arkansas Soft Pine for all interior and exterior woodwork, not because it was the cheapest, not because it cost more than any other wood, but because it was considered the best for the purpose.

**Ask Your Dealer**—Arkansas Soft Pine is within your reach. It is as close to the builder as the nearest lumber yard, with which arrangements can be perfected to secure supplies whenever needed.

We have published a treatise on the Use of Arkansas Soft Pine for Building.

*Send for Copy*

**Arkansas Soft Pine Bureau, 1738 Transportation Bldg., Chicago, Ill.**

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



manufacturer starts out to build some particular machine. It proves a success. Through his association with important customers, other wants are suggested, and before the manufacturer realizes it, he is deep into the manufacture of some other specialty, the making of which he did not originally contemplate. Growth of that nature is usually solid and safe, because it proceeds step by step, and with full knowledge.

An interesting illustration of that sort of growth is afforded by the C. H. & E. Manufacturing Company, Inc., who six years ago, started to build a Portable Saw Mill with power built-in, in other words: a combination Portable Saw Rig with gasoline engine or electric motor built under and in the table, making the outfit a complete unit, an outfit that the contractor could put on his wagon, take to his job and do all his millwork.

Their catalog now reads "CONTRACTORS' EQUIPMENT" and very properly so, for the manufactures are varied and might be called the keystone of requirements, or the little coterie of central needs, about which the work of every contractor necessarily revolves—Portable Saw Rigs of six different shapes and sizes, either gasoline engine or electric motor driven pumps, and pumps by the way of many sorts, hoists, and hoists, too, of divers kinds, plain material hoists and hoisting engines, Mortar and Plaster mixers, etc. As the manufacturers themselves say in their catalog, "Aside from being the PIONEER manufacturers of Portable Saw Rigs, we are large manufacturers of Builder's Hoists, Material Elevators, Power Driven Diaphragm Bilge Trench Pumps, Centrifugal Pumps, Piston Pumps, Man-hole and Force Pumps, Concrete Chutes, Mortar Mixers, Tar Kettles and Gasoline Engines."

As manufacturers of an extensive and varied line of contractors' equipment they were quick to recognize the marvelous superiority of a power saw over the hand saw, not only as a time and money saver, but a machine to do all millwork "on the job."

With the ever increasing demand among contractors for light portable machinery which can be easily moved from job to job, they have taken the lead in the manufacture of this equipment.

Every outfit they manufacture is built complete in their own shop from engine up and embodies these two vital elements: First—the equipment itself, its construction, design, power, economy and general service. Second—the facilities they have to give service, after the machine is placed in commission on the job.

### Fox Supply Company Brooklyn, Wis.

Through the courtesy of the NATIONAL BUILDER it was made possible for the Fox SUPPLY COMPANY to extend to its innumerable friends a Merry Christmas and a happy, prosperous New Year. We wish to thank you for your most liberal patronage of many years and we hope that our dealings in the years to come may be as pleasant as those in the past.

It is most gratifying to know and feel that our efforts to produce a Floor Scraper that has met the approval of Carpenters and Contractors has been rewarded.

Since we placed our first Floor Scraper on the market ten years ago, our business has increased yearly, now we are the largest exclusive manufacturers of Floor Scrapers and Floor Scraper Blades in the world.

No doubt we were fortunate in selecting the class of men who recognize and appreciate good tools, the "National Builders" of America. Our desire and ability to produce such Tools gave us our start. Maintaining this same standard served to weld the link. Now the Fox Floor Scraper and Floor Scraper Knives are known to nearly every Carpenter and Contractor working at the trade, and our unceasing efforts to maintain the high quality and standard of Fox Flooring tools will be most religiously maintained.

The Fox Floor Scrapers are made in five sizes to suit the needs and requirements of the man with thousands of feet of flooring to dress who is making a business of this class of work down to the man who has only one small job.

The reason we use a special grade of high carbon steel rolled to our special analysis is that in the manufacture of Floor Scraper Blades we found that in order to obtain the peculiar temper required it was essential to combine both hardness and toughness. This we accomplished after testing and experimenting with every known brand of

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**A Practical and Handy Treatise Giving the Best Methods of Using the Carpenter's Steel Square.**—By D. L. Stoddard. 109 pages, 112 illustrations. Cloth bound. Price 50 cents, postpaid.

The size of this book enables it to be carried in the pocket, hence the carpenter can always refer to it for the method of finding the different cuts used in roof framing, stair work, hoppers, towers and bicycle tracks; also directions for describing hexagons octagons and other polygons, circles, ovals, ellipses, brace measurement, dividing a cone, fascia and frieze cuts, besides directions in clear language for solving other knotty problems by the use of the square.

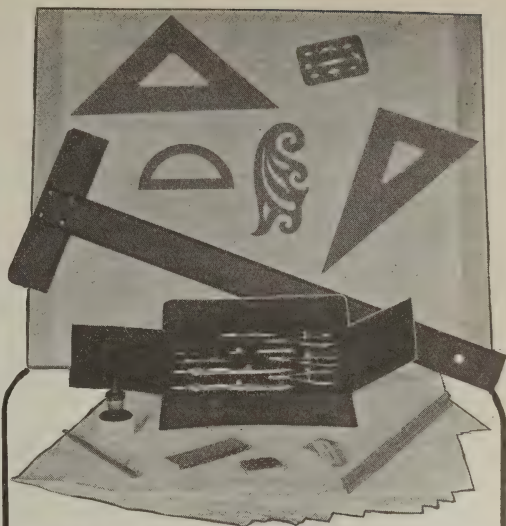
This book is thoroughly original; every cut is new and specially made for it. One new feature which will commend itself to mechanics is the absence of reference letters on the illustrations, therefore the reader will have no trouble in looking for the various A, B, C's, etc., which are sometimes confusing to beginners.

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steel of American and English manufacture. Today our Scraper Blades are used in a number of Floor Scrapers other than the Fox which goes without saying that our Blades like our Scrapers have built a reputation for themselves.

Again wishing you all the compliments of the season and all the prosperity that 1915 can afford, we are

Yours very truly,

FOX SUPPLY COMPANY.

By F. W. Campion.

---

**Parks Ball Bearing Machine Company**  
Fergus & Knowlton Sts., Cincinnati, Ohio

In extending the season's greetings to our past customers as well as to our prospective ones we believe that they all appreciate the efforts which we are making to give them a machine which will do their work as they would have it done. From year to year the Parks line has been improved and kept up to the highest point of perfection and the various attachments which can be used on it make it complete in every particular.

It is impossible to always anticipate the needs of our customers and it frequently happens that they have some particular requirement to meet which they cannot accomplish with hand tools or with many other machines. We always endeavor to so arrange our machines that they will do the simple and heavy work with rapidity and the complicated, particular work with accuracy. How well we have succeeded in thus satisfying our customers is shown out in our increased business from year to year.

We make a specialty of giving our customers just what they want and a statement of your requirements will bring an immediate response outlining to you just the size and style of machine and with what attachments we believe you can accomplish the work to the best advantage. Of course, it is understood that your complete satisfaction after a thorough test in your own shop is one of the conditions of sale.

Let us hear from you that we may become better acquainted.

---

**The Millers Falls Co.**  
Millers Falls, Mass.

It is the constant endeavor of the Millers Falls Company to keep in close touch with the users of tools and woodworking ma-

chinery and this opportunity to convey a message to them is therefore welcome.

Never before has there been so much life and energy in our company as during the past few years, and great progress has been made in improving old styles of tools and machines, and adding entirely new, original ideas. Our line of bit braces, for instance, has been doubled within the past two or three years, until it now comprises more than 250 different braces. The greater part of these are shown in our latest catalogue, which would be gladly sent to anyone on request. Hand drills, breast drills, star hack saw blades and frames, mitre boxes, extension bit holders and a score of other kinds of tools have all come in for improvements and additional designs that we are anxious to introduce to the readers of this magazine. Don't be satisfied with your old kit merely because you can "get along with it" through 1915, but examine our catalogue and get your dealer to spare a little time in showing you Millers Falls tools. Maybe you will consider that it will pay to renovate your kit. No tool manufacturer has originated so many tools as the Millers Falls Company, and they have many surprises that will be sprung upon the public in 1915. Write us your wants and troubles and they will receive full attention and a prompt response.

MILLERS FALLS COMPANY.

F. H. Atwood.

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**The Steel Scaffolding Co.**  
Evansville, Ind.

THE STEEL SCAFFOLDING COMPANY'S  
"TROUBLE SAVERS"

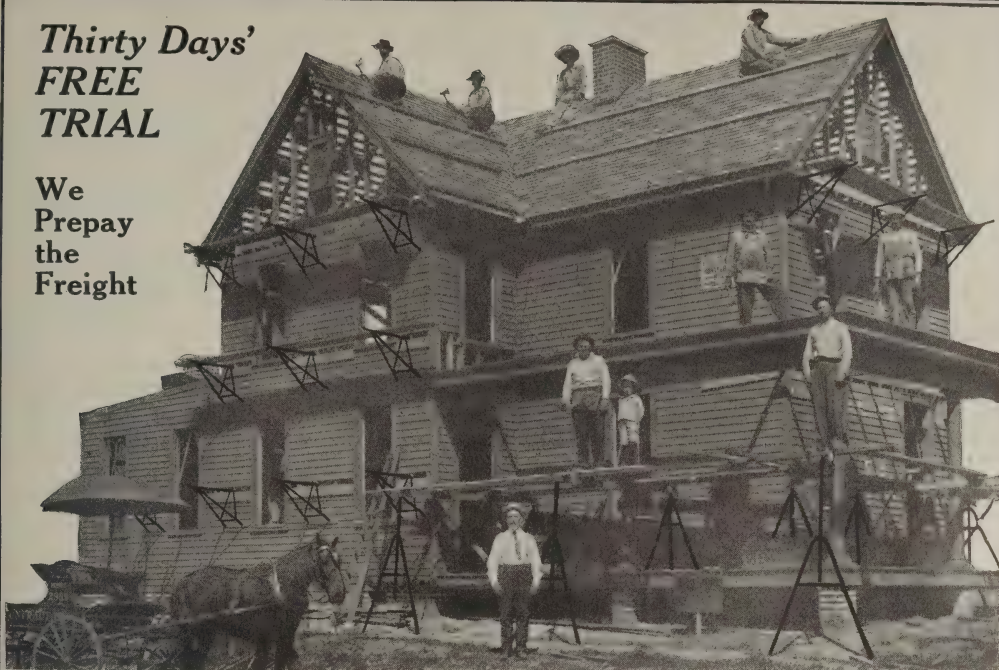
In making our bow to the readers of this Journal, let us introduce ourselves as the manufacturers of the "TROUBLE SAVERS" Steel Scaffolding.

The many improvements in equipment for Contractors; the advance in wages and material, including the advance in the price of lumber, makes the subject of scaffolding of greater importance than it has been in the past. In presenting our line of "TROUBLE SAVERS" Steel Scaffolding for Carpenters, Masons, Plasterers, Decorators and other Contractors, we feel we are offering the most practical line of the kind that has ever been offered to the public.

As an earnest proof of our faith in them

## Thirty Days' FREE TRIAL

We  
Prepay  
the  
Freight



## IT TOOK 10 MINUTES TO ERECT THESE "TROUBLE-SAVER" SCAFFOLDS

**N**OT one nail was driven in order to erect this scaffolding—not a nut or bolt was used—not a screw—the men simply hooked the steel supports around the studs, threw on the planks and went to work. It took them about ten minutes to do it. Had wooden scaffolding been used, it would have taken them fully half a day. ¶ The "Trouble-Savers" have two legs to stand on instead of one. It is the *strongest, safest* and most *steady* bracket on the market. ¶ It has no side motion at all as the weight on the outer end is divided between two equal supporting braces.

### BEST BY TEST

MACLEAN BUILDING CO.

Contractors  
92 Broadway, 6th Floor

Detroit, Mich., June 30th, 1914.

The Steel Scaffolding Co.,  
Evansville, Indiana.

Gentlemen:—Kindly ship at once, 8 dozen additional Weatherboarding Scaffolds—

**RUSH—RUSH—RUSH**

During the last ten years of operation and the construction of more than five hundred homes, we have used a variety of scaffold brackets and have found yours to be the best Scaffold Bracket on the market.

Yours very truly,

Maclean Building Co.  
Per P. D. Ellis.

THE JOSE-BALZ COMPANY

Home Builders  
740 and 741 Lemcke Annex

Indianapolis, Ind., Oct. 17th, 1913.

The Steel Scaffolding Co.,  
Evansville, Indiana.

Gentlemen:—We are enclosing herewith our check aggregating \$63.08 in full payment of Scaffolds under your invoice dated Sept. 29th, 1913. The Scaffolds are entirely satisfactory.

Kindly ship us as soon as possible, two more sets of these Scaffolds. Trusting the above order will receive your immediate attention and that we will receive the goods in the next few days, we remain,

Yours very truly,

Jose-Balz Co.  
Per Pete F. Balz, Pres.

## You Can Try "Trouble-Saver" Scaffolding for 30 Days

¶ You don't have to buy one piece of "Trouble-Saver" Steel Scaffolding until you have convinced yourself in the only way you could be really convinced that it is the thing you should have—that it is more than we claim for it. ¶ We will send you any number of the several different pieces, and *we will prepay the freight*, you can try them out to your heart's content for thirty days. Write today for this special proposition.

**STEEL SCAFFOLDING CO.,      EVANSVILLE, INDIANA**

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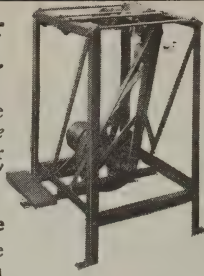


## Miller's Sliding Arbor Cut-Off Saw

Is best for small accurate sawing—operates by treadle—leaving both hands free for material. Cuts up to  $1\frac{1}{4} \times 8$ " stock.

Write now for Circular and Price on this and on my screen wire stretcher, clamping bench and laying out table, moulding mitre cutter, etc.

**A. N. MILLER, 750 38th St., Milwaukee, Wis.**  
Manufacturer of special Sash and Screen Making Machinery



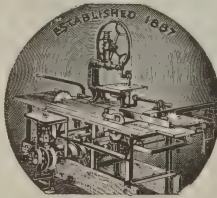
## Parks Portable Single and Combination Wood Working Outfits

Circular Rip and Cross-Cut Saw, Swing Cut-Off Saw, Boring and Tenoning machine, with 12-in. Jointer; 22-in. band saw, other valuable attachments can be added.

We are the originators of the Circular Saw, Band Saw, Jointer Combination; our latest innovation, *Swing, Cut-Off Saw* on same base; long table surface; saw pulls across timber instead of pushing long timbers across saw.

Machines are made in large quantities, which enables us to sell at lowest prices, and make immediate shipment. Ask for catalogue and find that we have the greatest improvements in single and combination machines.

**The Parks Ball Bearing Machine Co.**  
Fergus and Knowlton Sts.  
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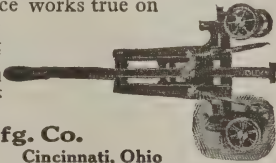


## An Opening for a Mortise Lock Can be Cut in Two Minutes by using the Miller Door Mortiser

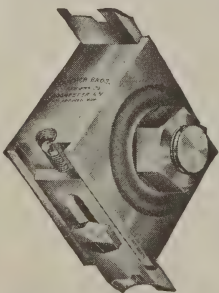
Little labor is required, and a perfectly true job is assured. Makes no difference what thickness the doors are, the device works true on them all. Complete with five cutters, covering locks from  $\frac{1}{2}$  inch to  $1\frac{1}{2}$  inches thick. A real time and labor saver. Sent subject to trial.

**A. W. Miller Mfg. Co.**  
Riverside, Calif. Cincinnati, Ohio

Our Butt Mortiser and Rule Gauge for 75 cents, Postpaid



## CUTTER HEAD



Patented December 30, 1913

Designed to meet the needs of the carpenter and builder who wants to make his saw table do more work. Any shape knives made to order. Runs like a solid cutter.

Catalog No. 34 sent on request

**Huthier Bros. Saw Mfg. Co.**  
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we sell them, subject to approval after thirty days' trial.

We believe the time is here, now, when scaffolding should be a definite part of a Contractor's equipment, and constitute an asset, rather than a continuous and increasing expense on every job.

With this issue we show our "TROUBLE SAVER" folding bracket scaffold for siding and weather boarding. It takes direct hold of the studding and cannot fall unless the studding gives way. The weight on the outer end of the bracket is carried by two equal supporting braces or legs that converge to the center in a way that makes the bracket absolutely rigid, and prevents any side motion whatever. It is this safety and solidity that recommends them to your workmen, giving them a firm, solid foundation to get about on, enabling them to do more work. You can place one of them in position in a second or remove it just as quick. It is not only a "TROUBLE SAVER" but a TIME SAVER—It saves material and prevents injury to your workmen.

We are selling these brackets direct to the Contractor under a guarantee for five years—there is no reason why they should not last for a generation,—and if anything goes wrong with them we will make it right at our own expense. We have hundreds of testimonials from all sections of the country that they are the best scaffold bracket on the market, the strongest, the safest and most practical. It is our ambition to maintain this reputation for all our "TROUBLE SAVER" Scaffolds, and we would prefer to have a customer return them at our expense than keep them if he were not entirely pleased with them.

The prices are reasonable and we pay the freight. Circulars giving full particulars will be mailed on request.

**A. N. Miller**  
750 38th St., Milwaukee, Wis.

There are a great many different kinds of machines out pertaining to the manufacture of Storm Sash and Screen work, but the greatest obstacle has always been the price, so that anyone outside of the large mill owner was not able to afford them.

This problem has recently been solved by us in the introducing of Special Sash and Screen machinery. It contains a complete

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"Stamped on the shank of every genuine IRWIN Bit."



## "IRWIN"--A Bit of Perfection

A Bit of toughest steel for the tough, knotty jobs. Trip hammer forged out of one solid piece of steel and tempered to perfection.

If "IRWIN" is stamped on the shank—that bit is bound to be a crackerjack—the best that money can buy. For years it has been the acknowledged leader. Take no chances but insist upon getting the genuine "IRWIN" from your hardware dealer.

THE IRWIN AUGER BIT CO., Wilmington, Ohio.

## Modern Carpentry :::: and Joinery ::::

Vol. II. Advanced Series. By Fred T. Hodgson, F.A.I.C.  
400 Pages; 300 Illustrations; 12 Mo; Cloth Binding.



This volume is somewhat similar to Vol. I, only on advanced lines, and is intended to follow up the progress made by a study of the first. Indeed, it is simply a continuation of the first volume, on a higher plane, and no workman having mastered the contents of one, will rest satisfied until he has also mastered the contents of the second volume.

This volume contains some examples of work, with a description of the way the work is performed, and the materials employed. Many very difficult problems are here shown and the solutions and explanations are given and fully explained, many things that at first seem formidable to the unpracticed workman, become quite easy of solution under the magic wand of the author's method of explanation.

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## Metallic Batten Strips For Barn Siding

And other buildings where vertical siding is used. These Batten Strips expand and contract with siding; no warping, splitting or drawing off. Metallic Batten Strips make the building wind, rain and snow proof, always lay flat, do not interfere with sliding doors and add to the beauty of the building.

Write for prices and free samples

**Metallic Batten Company**  
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## SAND'S ALUMINUM LEVELS

### WILL NOT WARP

Sand's Aluminum Levels are light, strong and durable. They will not warp, split or rust. Nothing to work loose or get out of order. Easy to handle. Need no adjusting. Made in 18", 24" and 30" sizes for Carpenters and 42" length for Masons. We also make a high-grade line of wood levels.

are honestly made of very high-grade aluminum specially prepared for this purpose. The finish is ideal and the greatest strength is placed where most needed. All unnecessary weight is left out. The plumbs are the best that careful experience can make. Each level is fully tested before it is offered for sale. You can count on Sand's Levels being perfect.

### ASK YOUR HARDWARE DEALER

to show you Sand's Levels. If he does not sell them let us know, and we will send you a circular showing full size view of our 24" Aluminum Level and 1/2 view of the 30". Just like seeing the actual levels.

J. SAND & SON, 1023 Rivard St., Detroit, Mich.

### Best Level To Use In Dark Places

The plumbs at each end and the double center level make it readable in any position and at arm's length. Pick it up any way. It is always in position. Vials covered with heavy plate glass which keeps out water, dust and dirt. A Sand's Aluminum Level will last you a lifetime.

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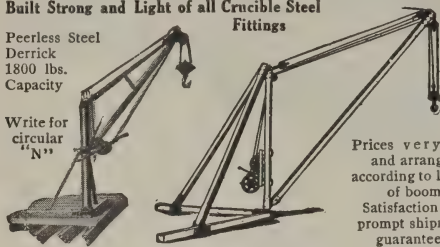


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Built Strong and Light of all Crucible Steel Fittings

Peerless Steel Derrick  
1800 lbs. Capacity

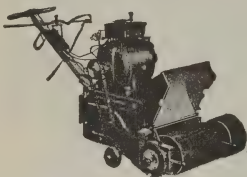
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Prices very low and arranged according to length of boom. Satisfaction and prompt shipment guaranteed.

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Patented Oct. 15, 1912.  
Made in several sizes.

will save you money by rapidly finishing your new or old floors just the way you want them. Self-propelling—you simply guide.

Write today for booklet telling all about the machine, our free trial offer and list of users near you.

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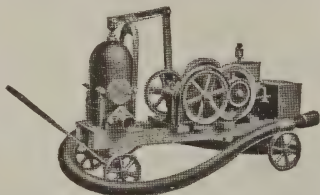
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is something the ordinary open type pump will not do. But because the No. 3 "BULL-DOG" is an extraordinary outfit we guarantee it to deliver water twenty feet above the pump. Complete descriptions of this, and other styles, given in catalogue No. 21; ask for a copy.

This is driven by a "Bull-Dog" engine—for good reasons.

Bates & Edmonds  
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## FREE TRIAL Rapid Floor Surfer

Made in  
Several Sizes

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225 W. Illinois St.  
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outfit to be used, especially by window screen makers and consists of the following:

A *Sliding Arbor Cut-Off Saw*, where both hands are free to handle the material, the feeding of the saw being done by simply stepping on the treadle with the foot. The table is stationary and the saw travels parallel and true under the table. It can be furnished with motor attached, if desired.

The *Clamping Bench and Laying Out Table* is also a new and novel device, whereby the clamping up and drilling of frames for dowelling is reduced to 1/3 of the time it takes ordinarily. This is the only system whereby the dovetail dowelling, which all progressive up-to-date manufacturers are using, can be successfully worked, as the material, after being cut, is dropped into clamps and not removed until the frame is all finished ready to be painted.

The *Screen Wire Stretcher* is another novel device that will surprise anyone who has never seen it before, as it will stretch and release the wire in three seconds. It is also worked by the foot, leaving both hands free to handle wire, tacks, etc.

The *Moulding Mitre Cutter* cuts two mitres at once and its working is so simple that any boy can operate it.

Any and all of these machines are very inexpensive and within reach of any ordinary screen maker or carpenter.

The workmanship, material and design is first class, being the results of twenty years' experience in the storm sash and screen manufacturing and over thirty years in the machinery building combined, a combination that cannot be surpassed in the building of special machinery.

With these machines, the time in the manufacture of sash and screens is cut in half, which any manufacturer will readily appreciate. In our present times the material and labor are advancing, consequently the time is the only part that will admit cutting, and these are the only machines which help you do it.

Where the plans and specifications for a building contract required the contractor to install plate glass mirrors for the medicine cases in the bathrooms, the contractor installed inferior mirrors, he was liable to the owner for his damages.—Hiller v. Daman, 166 S. W. (Mo.) 869.

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## Helpful Ideas On Dairy Barn Building Free!

If you learn more about the *newest, best, most economical* and most *sanitary* methods of Dairy Barn Construction — you will make more money. Our free book, "Building the Dairy Barn," tells about proved principles that it will pay you to know about. It tells facts about plank frames; King System of ventilation; proper width and arrangement; lighting; stable floors; site; size; appearance; design; drainage; and sanitary barn equipment with floor plans.

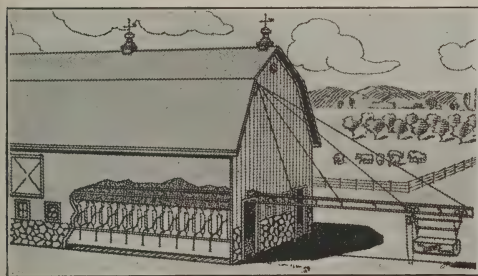


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Add to your profits by specifying and installing the Libbey Line of Barn Equipments. Also by securing our aid in planning out the most practical, up-to-date barn for each farmer's needs.

Libbey service and equipment will help you get contracts for barn building right in your locality—contracts that pay.

Farmers need modern, sanitary barns; you need the business; we need your help in selling our modern barn equipment. Let's get together.

Information on what we can do for you—and what you can do for yourself—will be sent on receipt of postal card.

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182 Marion Street

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## Specify a McCray

Then you will go a long way toward solving the "service end" of the new home. You will delight your clients with the convenience of arrangement and the satisfaction of giving them the very newest and best in scientific refrigeration. For the most elaborate mansion or modest of cottages there is a

## McCray Refrigerator

either in stock sizes or built-to-order, that can be made a part of the house and arranged for outside icing. The outside door for icing keeps the iceman and his muddy feet away from the kitchen. In cold weather no ice is needed.

The opal glass or porcelain linings are sanitary, and easy to clean. All the foods are kept fresh and cool and free from spoiling. All the odors and impurities are carried away through the water sealed drain pipe.

McCray Refrigerators are used wherever perfect refrigeration is demanded.

### Plan Service Free

We maintain a complete draughting department and employ practical draughtsmen, thoroughly trained in the principles of correct refrigeration. These men are at your service free. Send us your floor plan and we will send you suggestions for arrangement of the refrigerator.

### Get These Catalogs for Your Files

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No. AH—Built-to-Order for Residences.	No. 50—For Hotels, Clubs, Institutions.
No. 73—For Florists.	No. 61—For Meat Markets.

## McCray Refrigerator Co.

748 Lake Street, Kendallville, Ind.  
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For branch salesrooms in other cities,  
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## Galvanized Iron Cut Nails



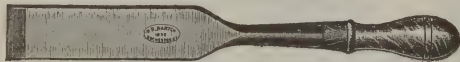
For shingles, slating, boat and wharf building, fencing, sheathing and all exterior work use

### Anchor Brand Iron Cut Galvanized Nails

as they will outlast the best of wood under all climatic and weather conditions.

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E. & G. Brooke Iron Co., Birdsboro, Pa.



## Tools Marked Like This



Last a Lifetime and Give Satisfaction to the End!

*The Highest Priced Edge Tools Made*

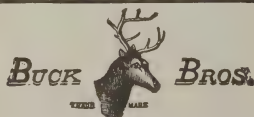
Ask for our catalog, book "True Stories" and "How to Take Care of Tools"—free.

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Brown's Race

Rochester, New York

1853



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**61 Years of Tool Making Behind  
Buck Bros. Products**



Our line of tools includes Gouges, Plane Irons, Chisels, Drawing-knives, Nail Sets, Screw Driver Bits, Carving Tools, etc. Our reputation guarantees them all. Catalog shows them all. Write for it.

**BUCK BROS. : : MILLBURY, MASS.**

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Made of Steel ——— Cannot Break



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**First in Quality  
& Improvements**

New STEEL BOTTOM PLATES with ANGULAR SERRATURES to prevent the work from slipping, and many other special features.

**GOODELL MFG. CO.,**

GREENFIELD - - MASSACHUSETTS

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ON LETTERS YOU  
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## TRADE REVIEW

### A Profit Sharing Plan.

A great many of our readers have already taken advantage of the profit sharing plan of the Hess Warming and Ventilating Co., 907 Tacoma Building, Chicago, Ill. Briefly stated, this plan consists of the preparation of heating plans, the loan of necessary tools to install the complete heating equipment and exceptionally low prices on furnaces and equipment.

The Hess Warming and Ventilating Co., advise us that the plan has met with great success and that they are anxious to extend it among our readers. Those who wish to take advantage of it should write to the Hess Company for particulars immediately.

### Winter Business

The approach of cold weather always finds a large number of buildings unprepared for it. In many cases, the owners have not considered the necessity for the greatest protection against the cold winds and so the winter finds them without adequate protection.

The Niagara Metal Weatherstrip Co., 737 Main St., Buffalo, N. Y., have anticipated this condition and are calling the attention of our readers to the excellent opportunity for securing good money through installing Niagara Metal Weatherstrip for doors and windows. They have an interesting proposition for those who wish to become their agents and we believe that it is a most excellent plan to look into.

### Concrete and Mortar Mixers

A great many of our readers find it advisable to do a variety of work. They take contracts not only where carpentry is involved but also where masonry, concrete, plastering and stucco work is also found.

Considerable ingenuity must be displayed in order to make any profits where several are figuring on the job, and it is only by the use of machinery such as concrete and mortar mixers that this can be done.

Advertisers' Section



## LOUDEN BARN PLANS

LOUDEN MACHINERY COMPANY  
FAIRFIELD, IOWA

## Will You Accept this \$1.00 Book of Barn Plans Free?

**Louden Barn Plans**, compiled and published by the Louden Machinery Company at a cost of more than \$3,000, contains the most valuable collection of practical barn plans ever assembled in book form.

The book has 96 pages, printed in two colors and beautifully illustrated. Its 194 plans, drawings and photographs illustrate practically every phase of modern barn construction, ventilation and equipment.

The primary mission of **Louden Barn Plans** is to encourage the building of better barns. Incidentally it will put you in touch with the greatest line of modern barn equipment in the market. This book does not describe the line, however, nor does its use obligate you in any way to specify Louden equipment.

*You need this book. It is stored with sound information acquired by our barn experts in a lifetime of experience.*

The publisher's price for **Louden Barn Plans** is \$1. It's free to you if interested in barn construction. Fill out coupon or mail a postal today—you might forget it tomorrow.

Note.—If you are interested in modern, sanitary barn equipment, check the square in the coupon or ask for complete set of catalogs. The Louden line includes stalls and stanchions, litter carriers, feed carriers, hay tools, barn door hangers, and barn specialties.

**LOUDEN MACHINERY CO.,**  
5602 Fourth St., Fairfield, Iowa.

Gentlemen: Please send me free of charge, a copy of your book **LOUDEN BARN PLANS**.

Name .....

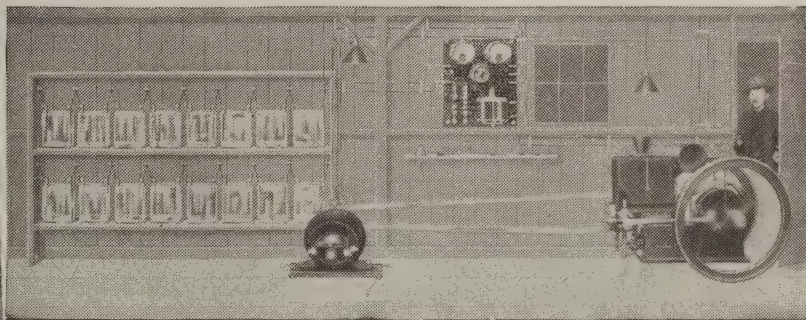
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Note.—If you wish complete set of catalogs check this square ☐

**LOUDEN MACHINERY COMPANY**

5602 Fourth Street

Fairfield, Iowa



## You Are the Right Man

because of your knowledge of mechanics and your acquaintance among farmers who ought to have, and can easily afford one of our especially designed

### Farm House Lighting Outfits

which are a real economical necessity for the farm, and not an expensive luxury. This proposition offers unusual opportunities in an unlimited field which is not overworked and in a line which will bring handsome profits.

**Get a Free Lighting Outfit** for your own use and demonstrating purposes. This will do much to aid you in making sales, as nothing is more convincing to the prospective buyer than a practical demonstration. This is one opportunity that you cannot afford to pass by without investigating. It is to your interest that you *write for special proposition today.*

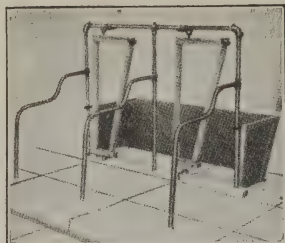
**The Dayton Electrical Mfg. Co., 197 Emily Street, Dayton, Ohio**

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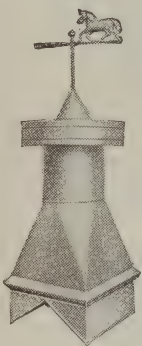


## Answering the Stable Question

That is what the Mullins System does satisfactorily for the farmer — and every job contractors put in means more work in that locality at good profits for the contractor.

Write for folder, "Answering the Stable Question," showing Mullins' high class stanchions, stalls, managers, patent gate, feed and automatic water system.

Mullins Manufacturing Co. - - Brillion, Wisconsin



## The GALE CUPOLA

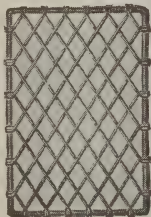
A perfect ventilating system that costs little and is suitable for all buildings. Not affected by storms or birds. Easily installed; no framing, just nail it on.

Other styles in catalog; get a copy.

Galesburg Sheet Metal Works  
142 So. Prairie St., Galesburg, Illinois

## Do You Require Iron Work?

We Manufacture



Iron Stairs	Fencing
Fire Escapes	Stable
Jail Cells	Fixtures
Balconies	Marquise
and	
Light Steel Work	

Our Prices Will Interest You

THE MACK IRON AND WIRE WORKS CO.  
6 WARREN STREET, SANDUSKY, O.

## Boss Carpenters

and Journeymen Carpenters have many a week with no work. Why not attach to Chairs and Furniture Evergrip Gliding Casters? We furnish plenty Free Demonstrating Sets.

### HERE'S OUR OFFER

Send your business card or letterhead and we will send you 100 sets. Also 25 FREE Demonstrating Sets. Sell the 100 sets for 10 cents a set. Your profit \$7.00. Send no money till all are sold. Then order more. With each lot we send 25 Free Demonstrating Sets with each 100 sets. If the Boss Carpenter can't spare the time, arrange with your Journeymen and divide profits. Thousands can be sold. The public will appreciate the Free Demonstrating Sets and buy 6 to 20 sets. The good will of the people thus secured may result in carpentry work for the boss. Either way you win. We have over 150 Carpenters going well with this proposition. Now Carpenters go to it!



STRANSKY MFG. CO Dept. R 20 Warren Street, NEW YORK

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The Van Duzen Concrete and Mortar Mixer, made by the Van Duzen-Roys Co., southwest corner State and Third Sts., Columbus, Ohio, is designed for mixing either concrete or mortar. It is arranged with several time and labor saving devices and can be operated with a surprisingly small number of men when its capacity is considered.

The Van Duzen-Roys Company wish to send each of our concrete and mortar using readers their catalog showing this complete outfit.

## The Little Wonder Tool Chest

C. E. Jennings & Co., 71-73 Murray St., New York, U. S. A., are placing on the market their "Little Wonder" Tool Kit No. 60. This is a Tool Kit that is *different*. It has a removable tray with a wire handle and spaces for nails, screws, tools, etc., and this tray may be carried from place to place as the work requires. This is a unique and desirable feature. The handle of this tray acts also as a handle for the chest, which is made of handsomely finished, seasoned lumber. The Chest has strong strap hinges and suit case bolts and is lock-cornered. This Tool Kit contains twenty-two useful and fully warranted tools. It is of convenient size, 17" long x 8" wide x 6 7/8" high and weighs filled with tools about eleven pounds. It makes a handsome and useful holiday gift and may be sold at a moderate price. It is, therefore, desirable for the holiday trade and is proving a great seller. In shipping the handle may be pushed down flush with the lid.

Circulars of the No. 60 "Little Wonder" Tool Kit will be furnished on application.

## The Waterproofing Handbook

The General Fireproofing Co., 611 Logan Ave., Youngstown, Ohio, have prepared a most valuable handbook on waterproofing, describing and illustrating economical and effective methods of waterproofing concrete and all forms of masonry. Directions are given for preserving interior and exterior decorative effects and for protecting finished surfaces against water, wear and stains. These results are obtained by the use of the waterproofing products and technical paints made by the General Fireproofing Co.

Advertisers' Section



Built on a new principle—horizontal wood panels and steel ribs—correctly proportioned—beautiful skyline. Gives better service than other silos—sells easier.

## Carpenter Contractors Wanted To Erect Minneapolis Panel Silos

In one of the great dairy states, 50,000 silos were erected last year—a larger number than ever will be built *this* year. You can secure the work of erecting the Minneapolis Panel Silos in your locality and keep busy throughout the season. In addition to doing the work you can also make the *commission* on their sale. *We help you.* Write today for full particulars.

Puffer-Hubbard Mfg. Co., 3214 26th St. East, Minneapolis, Minn.



## DREW STALLS AND STANCHIONS

**Are the World's Best**

When you get a contract to build and equip a barn, equip it *right*. Recommend "DREW" Sectional Steel Stalls and Stanchions. Drew equipment contains special features found in no other line. Drew Stall Frames adjust instantly without removing a single bolt, giving perfect alignment of cows on gutter; also special adjustment for different neck widths from calf to grown-up.

Instead of the usual cowstop, Drew stalls have one on each side, making doubly sure that cow cannot miss the stanchion; stops fold against partitions out of the way.

Don't accept the claim that other barn equipment is "just as good as the DREW;" find out! Write for new 48 page Drew Book. It's free, and you need it.

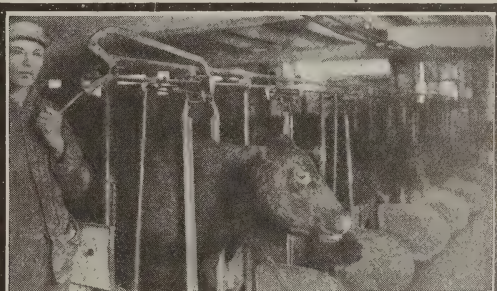


Write  
For This 48 Page  
FREE BOOK



**DREW  
CARRIER  
COMPANY**  
117 Monroe St.,  
Waterloo, Wis.

Eastern Branch:  
Rome, New York



## Barn Business For Building Contractors

Building and equipping barns is business **you** can get. And the better the equipment, the better the business will be.

We can show you **how** to get this business with the least effort; ask **us**.

We can furnish you with barn equipment that will bring you repeat orders.

**West Bend Automatic Swinging Stanchions** are demanded by progressive farmers. Our patented Lever Device enables any number of cows to be released from, or locked in, their stalls at one touch of a lever. Every farmer knows what this means in case of fire.

### WRITE TODAY

for prices and our co-operative proposition.

West Bend Barn Equipment Co., 211 Water St., West Bend, Wis.

## ESTIMATORS' PRICE BOOK AND POCKET COMPANION By I. P. HICKS

Second Edition, revised and enlarged. Over 180 pages. A guide to prices of all kinds of building materials, with handy rules, tables, and miscellaneous information for the estimator. *Price, postpaid, \$1.00.*

HODGSON BOOK CO., 537 SO. DEARBORN ST., CHICAGO

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The Recessed Steel  
Medicine Cabinet

## Hess <sup>MEDICINE</sup> ~~SANITARY~~ Locker <sup>CABINET</sup> The Only Modern, Sanitary STEEL Medicine Cabinet

or locker finished in snow-white, baked everlasting enamel, inside and out. Beautiful beveled mirror door. Nickel plate brass trimmings. Steel or glass shelves.

### Costs Less Than Wood

Never warps, shrinks, nor swells. Dust and vermin proof, easily cleaned.

### Should Be In Every Bath Room

Four styles—four sizes. To recess in wall or to hang outside. Send for illustrated circular.

HESS, 907 L Tacoma Bldg., Chicago  
Makers of Steel Furnaces. Free Booklet.

## Saved by buying a \$50 BOVEE ECONOMY FURNACE \$50

At Manufacturer's Prices

Has a large combustion chamber. Saves one third of the fuel. Has perfect

### Ventilating System

### The Most Perfect Hot Air Plant Sold

Send pencil sketch of floor plan for our manufacturer's price and illustrated catalog.

Bovee Furnace Works  
60 8th Street Waterloo, Iowa



All Steel All White

## The White House Medicine Cabinet

All-Metal White Enameled, with Bevelled Plate Mirror, 9"x12", and Polished Metal Shelves.

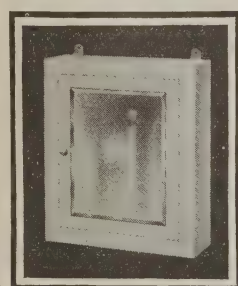
Height, 19" Width, 16" Depth, 5"

Write for Catalog and Discount

Price \$8.00

Also All-Steel White Pantries, Tables, Kitchen Cabinets, etc. Special discount to contractors on first orders.

"Renowned for Excellence"



The Faultless Iron Co. : : St. Charles, Illinois



## Hot Water Heating From the Fireplace

Cut shows section of our Heating Coil which if placed in any fireplace will heat six times the amount of space without additional cost of fuel, and affords the same healthful ventilation. Will suit any fireplace or mantel. Write for descriptive circular.

### Heitland Grate & Mantle Co.

No. 128 N. Fifth Street  
Quincy - Illinois

Practically every phase of building construction requiring waterproofing or protection is thoroughly covered in the most scientific manner. Drawings and diagrams aid in the explanations and specifications, the whole being combined into an attractive handbook which can be kept for ready reference.

The handbook contains, besides the directions for waterproofing under various conditions, a number of valuable tables showing the volume of plastic mortar made from various proportions of materials, cubic yards of concrete required for beams, quantities of material for one cubic yard of concrete, for various proportions of ingredients.

The General Fireproofing Co. believe that every one of our readers are interested in this handbook and they are therefore prepared to send it to them.

## Durable Silos

The contractor who has difficulty convincing a farmer that the concrete silos built by the Polk System are a good thing should read this little poem to them as it strikingly illustrates the benefits to be derived from this method of construction:

Sing a song of silos,  
Tons of juicy food,  
Cattle with an appetite,  
Lookin' sleek and good.

Nothing in the cornfield  
But a little stubble,  
All is in the silo—  
Not a bit of trouble.

Farmer with a balance  
Snoozin' in the bank,  
Sixty horsepower auto—  
Starts without a crank.

How'd he make his money?  
Saved it on his corn.  
Polk System Silos!  
Honk! goes the horn.

The Polk-Genung-Polk Co., Fort Branch, Indiana, have a long list of farmers who answer this description as well as literature on the subject of Concrete Silos, which will be of interest to our readers.

Advertisers' Section.

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## \$300 in 30 Days!



Being made by Robinson salesmen. You—yourself—can positively make \$60 and expenses every week. I want men like you, hustling, energetic, ambitious fellows, anxious to make money, who are willing to work with me. Not for me, but with me. I want you to advertise, sell and appoint local agents for the **biggest, most sensational seller in 50 years**—the ROBINSON FOLDING BATH TUB.

Here's an absolutely new invention that has taken the entire country by storm. Nothing else like it. Gives every home a modern up-to-date bathroom in any part of the house. No plumbing, no waterworks needed. Folds in small roll, handy as an umbrella. Self-emptying and positively unleakable. Absolutely guaranteed for 10 years. Hustlers, east, north, west, south—coining money. Orders, orders, everywhere. Badly wanted, eagerly bought, for remember, **fully 70% of homes have no bathrooms.** Immense profits for you. Two sales a day means \$300 a month. Here's proof—real proof. Smith, Ohio, got 18 orders first week; Myers, Wis., \$250 profit first month; Newton, California, \$60 in three days. Hundreds like that. Pleasant, permanent, fascinating work.

This is not idle talk. Make me prove it. Write a postcard. Let me write you a long letter. Then decide. No experience needed, no capital. Your credit is good if you mean business. But you **must** be ambitious, you must want to **make money.** That's all. Write a postcard **now.** I want to pay you sixty dollars every week.

H. S. Robinson, Pres., The Robinson Manufacturing Co.  
Canada: Walkerville, Ont. 717 Factories Bldg., Toledo, Ohio

## Two Books that Every Builder Needs

"Tiles and Mosaics"—Describing the complete Lorenzen line of tiles, mosaics and ceramics for bathrooms, kitchens, hallways, drug stores, ice cream parlors, banks, buffets, walls, wainscoting, store entrances.

"Vogue in Fire Places"—A complete treatise on fire place construction, profusely illustrated with color plates and photographs in a wide range of designs; each carefully priced.

Both books demonstrate Lorenzen quality in construction, material and workmanship—the safest guarantee a builder can have.

You should have both of these books in your files. A post card brings them. Write today.

Send for our liberal discount proposition to carpenters and builders.

Chas. F. Lorenzen  
& Co.,  
101 No. Clark St., Chicago



### Everything in GUARANTEED PLUMBING and HEATING SUPPLIES at WHOLESALE

Bathroom Outfits, Sinks, Pipe, Fittings, Valves, Faucets, Heating Boilers, Radiators, Water Pressure Systems and Lighting Plants for Country Homes, etc. Our \$200,000.00 plant behind our GUARANTEE. Send for complete Catalog No. 31.

JOHN HARDIN COMPANY

30 Years at 45th and Cottage Grove Ave., CHICAGO, ILL.

## Running Water Hot and Cold Without Plumbing

Contractors and Builders! Here's a chance to offer your patrons running water, hot and cold, without plumbing. Get them to cut down their plumbing bills by furnishing them with this handsome, modern convenience. You make

a nice profit; you please your customer.

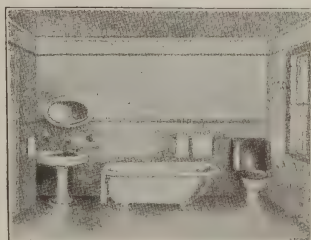
### Agents Wanted

Besides installing Ro-San Washstands on your own jobs, you or your foreman or your son can make a nice income acting as our permanent agent. You can build up a good solid business. Liberal terms. Write today for details.



Rowe Sanitary Mfg. Co., 201-A 6th St., Detroit, Mich.

Ask about the Ro-San Chemical Indoor Closet—  
Absolutely Odorless



### FULL LINE of PLUMBING and HEATING SUPPLIES

Sold Direct at  
Wholesale Prices

**20% to 40%  
Saving**

Complete bathroom  
outfits, tubs, closets,  
lavatories, kitchen

sinks, etc. Prompt shipment from a complete stock. The only house selling up-to-date, guaranteed goods at wholesale direct. Write for illustrated catalogue and prices.

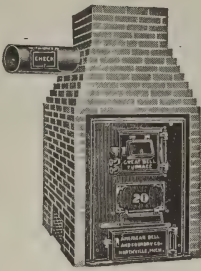
B. Y. Karol, 768-72 West Harrison St., Chicago, Ill.

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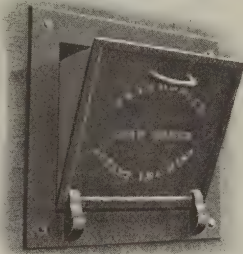


## A Hot Air Furnace

you ought to know about. Costs no more than a base burner, heats twice as much on about the same amount of fuel. No pipes, no lost heat. Brick or portable. Write and learn.

**American Bell & Foundry Co.**  
Northville, Michigan

## The Enterprise Coal and Fuel Shute



### The Easiest Installed

Non-Breakable—and Cheap— and Simplest Fuel Shute made. Cheapest because simplest.

Only four pieces—Frame, Spout, Lock and Weight. Roller bearing hinges; no exposed bolts to tamper with. Positively no way to open it from the outside. All of cast iron—practically rustless.

Sent to any address on receipt of \$7.50. Write for Builders' and Dealers' Discount

**Enterprise Iron Works**  
Albert Lea, Minnesota

## Buckeye Iron Planes Will Not Chatter

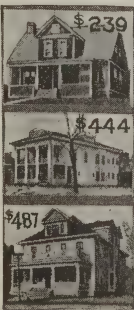
Neither will they clog or tear out, even when used in the most difficult woods. We guarantee all this. They overcome all the objectionable features usually connected with iron planes.

Furnished with smooth or corrugated bottoms, japanned or nickle plated. Prices: Smoother, \$2.00; Jack, \$2.50; Fore, \$3.00. Prepaid to any point in U. S. Order one—money back if not satisfied.

**Buckeye Saw Vise Co.**  
2050 W. 55th St. Cleveland, O.



## Hot-Water Heating



For Old or New Houses

Get our Estimate on Your Next Job

We pay freight

**BIG BOOK FREE**

### Profit For Contractors

Our steel boilers and piping systems "cut-to-fit" each job give contractors extra profit and enable them to install the best system made. Ask about our method.

**ANDREWS HEATING COMPANY**  
1458 Heating Bldg. Minneapolis, Minn.



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## The Standard Concrete Mixer Helps to Earn \$17,000 in Bonuses for It's Owners

Again The Standard Low Charging Concrete Mixer has shown its dependability by making it possible for its owner to earn a big bonus for speedy work in the installation of weighing equipment for the Government of Uruguay at the Port of Montevideo.

The specifications provided that the furnisher of the weighing equipment had to make delivery and to have erected all the equipment within three months. The contract also contained a proviso that a bonus of Five Dollars per day per weighing device was to be paid in which the specified date of completion was anticipated and a like penalty be forfeited for every day beyond the specified date for completion of contract.

Much depended on The Standard when you consider that it required about six weeks to transport the equipment together with the mixer. Materials had to be assembled, pits had to be dug and foundations laid before any of the weighing equipment could be installed. The work had to be done with the utmost care when you consider the fact that the entire imports and exports of Uruguay amounting to \$85,000,000 pass through this port and all must be weighed.

In this case an advantage was derived by The Standard being ready to run onto the job upon its arrival. These concrete mixers are very simple in design and are completely assembled ready for operation when they leave the factory.

Another important feature of these mixers, they are designed so that the drums are charged low at the base. By being built so low, that direct charging from the barrows save the need of having a loading skip. The point of charging is only 24 inches above the ground.

The Standard Mixers have many other characteristics which are distinctive of this make.

By conferring with the manufacturers, The Standard Scale & Supply Co., of Pittsburgh, Pa., with branches in New York, Philadelphia, Chicago, and Cleveland, they will be very glad to send information and illustrations of their big line of mixers.

Advertisers' Section.

## Get the Composition Floor Business of Your Town



**Big profits for  
your fall and winter months  
Investigate now!**

## Santilite Sanitary Composition Flooring

It is laid in a plastic state on any old or new wood or cement floor. Sets in 8 to 10 hours into a continuous, smooth, jointless surface that is fine grained, sanitary, fire-proof, water-proof, germ-proof and wear-proof floor.

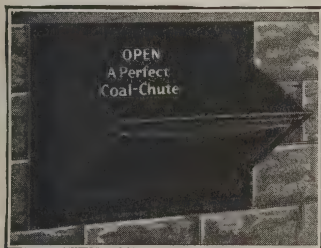
"SANTILITE" is easy to keep clean—does not have to be scrubbed—almost noiseless—absolutely no dust from abrasion—resilient—not slippery—has an excellent appearance—will not crack under ordinary settlements and is not expensive.

"SANTILITE" is especially adaptable for kitchens, refrigerator rooms, pantries, laundries, bath rooms and lavatories in residences. For old or new floor construction in offices and stores and will replace dusty, dilapidated floors without shutting down the plant in factories.

We sell you the material and give very full and complete instructions for laying floors. Colors, light red, light gray, dark gray, buff and green. *You lay the floor. Easy work and big profits.* We offer special discounts only to contractors and building supply dealers. Write us at once for our proposition and prices and keep busy during the winter months.

**SANITARY COMPOSITION FLOOR CO.**  
**340 West Fayette St. Syracuse, New York**

No raise in price on account of increased cost of materials due to the European War

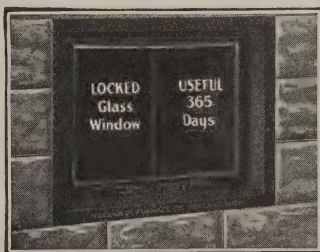


**If You  
Build,  
Buy,  
Own**

Be up-to-date  
and have the  
world's best—

**The Window Chute for your coal bin.**

**Thousands  
in use—  
The very  
Best.**



Write for Booklet "C."

**Holland Furnace Co., Holland, Mich.**

World's Largest Direct Installers of Furnaces.

## Hess Steel Furnace



Thousands of families, paying a few dollars down and a dollar or two weekly, have made their homes warm and cozy with HESS FURNACES.

HESS FURNACES burn any fuel and save all the heat.

HESS FURNACES, sealed by welding, never leak gas nor dust. Ordinary cement-joint furnaces fail in this.

HESS FURNACES produce an atmosphere like midsummer, by rapidly circulating pure, warm air, properly moistened. You don't get it with other methods.

HESS FURNACES respond promptly and perfectly to regulation, and meet any weather conditions.

HESS FURNACES are easy to install, simple to operate, and cheaply maintained.

HESS FURNACES are easy to buy—at factory prices—installments or cash, combined with a Profit Sharing plan which returns to you part or all of the price you pay.

### Special Terms to Contractors

If you are a contractor mention it when you write.

Write us, and let us tell you more about it. Booklet and estimate on request.

**Hess Warming & Ventilating Co.**  
**907 Tacoma Bldg., Chicago, Ill.**

Makers also of White Steel Medicine Cabinets

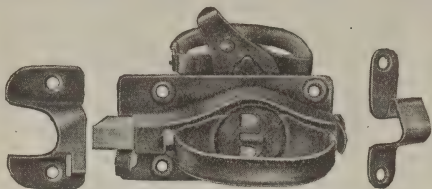
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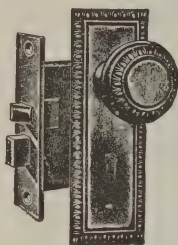
## Whitcomb Steel Barn Door Latch



**Over 13,000 Dozen Sold Last Year**

A strong, durable, convenient latch, adjustable to doors of any thickness; will not catch harness. Two large handles permit opening of doors from either side. Each latch provided with two catches to hold door open and closed. Also arranged for use of a padlock.

**Albany Hardware Mfg. Co., Albany, Wis.**



**34c for this Lock Set**

No. 5311 Antique Copper Finish

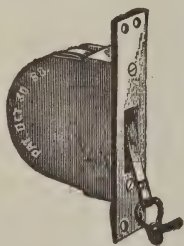
**FREE Builders' Hardware Catalogue and net Price List to contractors and material men. Easiest to select and buy from.**

We do not sell to carpenters or contractors in Cook County, Illinois

**REHM HARDWARE CO.**

**1503 Blue Island Ave., Chicago, Illinois**

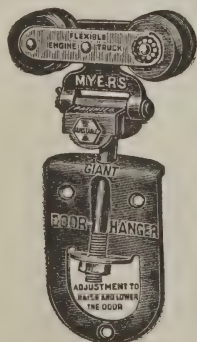
## Caldwell Sash Balance



Does away with weight and cords and **vastly** more durable. Makes sashes work perfectly. Permits greater window space in new work, as box frames are not necessary. May be applied to old windows without altering sashes or frames.

Write for Circular to

**Caldwell Mfg. Company**  
2 Jones St., Rochester, N. Y.



**MYERS GIANT**

**and New-Way Adjustable Tendem Door Hangers**

PATENTED

**For Tubular Girder Track**

Are adjustable up or down, and in or out. Trolley Wheels are heavy turned steel, revolving on steel roller bearings, and run inside the tubular girder track. Not affected by rain, sleet or ice. Write for descriptive circulars and prices.

**F. E. MYERS & BRO.**  
ASHLAND, OHIO

## Impervite for Waterproofing

An interesting example of the water resisting qualities of Impervite Waterproofing Compound were recently held in a New Jersey mine. It was necessary to close a tunnel from which water issued in a considerable stream. A wall was built of reinforced concrete and arrangements were made for grouting the walls with an Impervite Mortar. This mortar was forced into the wall and it is interesting to note that after completion the wall withstood a pressure of 160 pounds per square inch with an almost negligible leakage. The completed wall was eminently satisfactory for the purpose.

Impervite is used to waterproof basements, pits, walls, floors, etc., whether against actual pressure of water or merely against the ground dampness. Book No. 13, issued by the Standard Paint Co., of New York describes a number of methods of using Impervite and will give the Contractor much valuable information on this subject.

## Barn Ventilation

Every barn is provided with some means of ventilation, if only the chinks and cracks through which the wind whistles at will. This is not the best method for it leaves entirely too much to the caprices of the weather.

Every barn should be designed with an intelligent ventilating system by which the fresh air is taken from outside of the building and passes through regular channels and is discharged through suitable ventilators located on the roof. With such a system every part of the barn secures just the right amount of ventilation, thus adding greatly to the comfort of the animals kept in the barn.

The Globe Ventilator Co., 203Z River St., Troy, N. Y., in their catalog Z, tell many interesting facts about ventilators and ventilation for barns, factories, residences, etc. The catalog will be sent to our readers on request and should prove of value to them in designing farm buildings, factories and similar structures.

Advertisers' Section.

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# Price \$1.00 —if you order quick

The regular price of the *Ideal Rafter Square*, *Try Square* and *Mitre Square* is \$2.00—and, at that, it's a big economy. For a limited time you can get one-half price, \$1.00.

With the Ideal you can lay out cuts for any style rafter—Common—Hip—Valley—Jack or Cripple. Absolute simplicity, positive accuracy. Just the tool for making *all* backing cuts; a time saver for Bay Window and Mitre work. Cuts \$1 different angles. Folds up into small space for the tool kit.

This is a new tool, and we want to get it introduced; this is the reason for our half-price offer. We *know* every user will boost it and sell several more through his recommendations. You *need* this tool—order *now* while you can save a dollar.

## This Movable Bar →

shifts, giving you all desired angles for Rafter Work, Mitre Work, Many-sided Figure Work, Bay Windows, Interior Work, Etc. Simply spring pin into desired hole and tighten thumb screw. Bar is shifted by springing from one hole to another in every scale. Pin loosened only to change scales.

### 500 MEN

in every state can buy the Ideal Square for \$1.00—then the price goes up. To make sure of getting yours at half-price, fill out and mail the coupon—*today*.

**FREE**

**Instruction Booklet  
sent with each Tool**

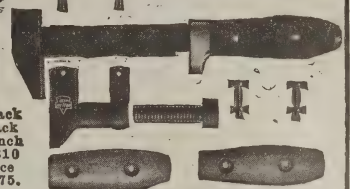
TRY  
IDEAL RAFTER SQUARE  
MITRE

## You Can't Beat This *KEEN KUTTER* Wrench

This Keen Kutter wrench is put together to *stay*. It is made of flawless tool steel of *first quality*. The bar is forged in *one solid piece* from end to end and the handle is part of the bar. There is *no nut* at the end. The selected beech wood gripper handles are fastened to the shank with two steel rivets. No strain can work these handles off nor loosen them. This Keen Kutter wrench stays with you. If it fails to withstand the roughest usage that a wrench can get, the dealer is authorized to refund the money.



Black  
Jack  
Wrench  
KB10  
Price  
\$0.75.



Send for our Home Furniture Design Booklet No. M-976.

If not at your dealer's, write us.

**Simmons Hardware Co.**

St. Louis New York Philadelphia  
Toledo Minneapolis Sioux City  
Wichita



## Books for Painters

By A. ASHMUN KELLY

Second Edition of the *Expert Painter's Estimator and Business Book* contains all that can be told about reading plans, measuring both from plans and from actual work, and estimating correctly. Painters need this book. *Price, postpaid, \$1.50.*

The *Expert Calciminer*, a text book and manual for decorators. All that the interior decorator or student needs to know about water colors for wall and ceiling decorations. *Price, postpaid, \$1.00.* Send all orders to

Hodgson Book Co., 537 So. Dearborn St., Chicago

### Special Introductory Offer

Ideal Tool Works, Middletown, New York

Gentlemen—I wish to take advantage of your special advertising offer and am enclosing \$1.00, for which I am to receive, prepaid, your regular \$2.00 Ideal Rafter Square, Try Square and Mitre Square

Name.....

Address.....

Town.....

State.....

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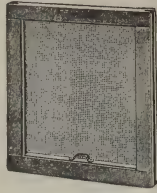


## Wanted Everywhere

Reliable Carpenters, Builders  
and Material Men

## To Make Big Money

taking orders for our made-to-measure "Fly Screens and Screen Doors" for dwellings and porches.



### GET OUR AGENCY PROPOSITION

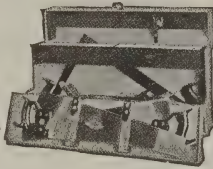
We use the best grade of wire, black enamel, galvanized, pearl, peerless and copper bronze, fastened by the improved **Standard Shoulder Strip Method**, makes the wire drum tight and firm, cannot sag or pull away.

Standard Screen Co., 1846-58 Hastings Street, Chicago

## INDESTRUCTIBLE Carpenters' Tool Cases

Stronger than any wooden chest, much lighter, holds tools better, much easier to carry. Same shape as a suitcase when folded and carried like one.

Made of 3-ply veneer, covered with heavy canvas and painted. Edges and corners are bound and reinforced with steel. Two brass catches and locks. Contains a place for every tool. Two sizes—31 in. for 26 in. saws, 33 in. for 28 in. saws. Will last a lifetime. Write for booklet and prices now.



**WEDELL & BOERS**

157 Jefferson Avenue, DETROIT, MICH.



## THE ENDEBROCK TOOL CHEST

Suit case shape, compact, convenient and keeps the tools in good shape. Size 34x6x14½. Strongly constructed and *steel covered*. Space for four saws, 16" Tongue Square, Iron Smooth and Jack Plane, etc. Send \$6.00 and your dealer's name; more details first, if you wish.

Dealers write for particulars of our great agency offer.

F. Endebrock Trunk Co., St. Joseph, Missouri

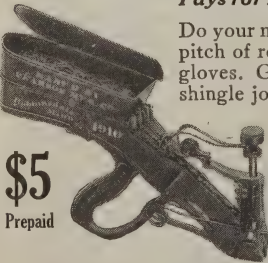
## PEARSON'S AUTOMATIC SHINGLE NAILER

*Pays for Itself on the First Job*

Do your nailing faster and on any pitch of roof. Wear mittens or gloves. Great for use on stained shingle jobs.

**\$5**

Prepaid



Made in two sizes—BLUE for 3d common No. 14 gauge wire nails. RED for 3d galvanized No. 13 gauge 1½ in. wire nails. **Get a nailer direct from us.**

Money refunded if not as represented  
**PEARSON MFG. CO.**  
Robbinsdale, Minnesota

## Technical Instruction

The American School of Correspondence, Chicago, Ill., advises us that their course of fifty-one text books on contracting and building is just the thing for the sub-contracting mason or carpenter who wishes to handle the whole general contract, to work himself up as a builder, or for the ambitious foreman who wishes to perfect his knowledge in the general building line. The system of instruction which accompanies these books enables the student to do all of the work at home while the effects of the instruction begin almost immediately. By studying the theoretical and practical principles of business while working at the job, he is able to see the reason for a great many things while otherwise he would be at a loss to understand. In short it prepares the student for directing the office and construction work of a general contracting company or for a position as building superintendent or inspector in all branches of frame masonry and concrete work.

A special bulletin which gives full details of this and the allied courses will be sent to our readers on request.

## Repairing the Leaky Roof

There are so many places where Hetzell's elastic roof cement and paints can be used that the manufacturers, the Estate of J. G. Hetzell, 63 Main St., Newark, N. J., have issued a special circular regarding the use of these preparations. The circular deals with tin, iron and other metal roofs, slate roofs, sky-lights, and green houses, etc. It also has valuable information regarding walls, floors, and other surfaces. It would be of interest to every contractor who lives in a climate where the rain ever falls and that takes in pretty nearly the whole civilized world.

The contractor should have this circular as well as prices of the above preparations.

## Interchangeable Steel Forms

The Lambie Steel Form Company, 299 Broadway, N. Y., have just issued a pamphlet on their interchangeable steel forms for cast concrete houses and buildings. This circular shows in detail the erection of a modern residence and indicates the ease with which the work can be carried on.

Lambie Interchangeable Steel Forms pos-

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sess many advantages over the old method of building up wood forms. Their durability is another valuable feature, while the smooth surface which they leave saves much time, labor and material in the finishing. It is interesting to see that an entire house of two stories and basement can be poured with only three changes in the forms. This is a great saving in time over former methods of construction.

Lambie Interchangeable Steel Forms made in a great variety of styles and sizes and, we understand, can be either bought or rented. Contractors and builders who are interested in modern construction and especially in concrete building, should have the above mentioned circular so they may investigate this subject thoroughly.

### The Metcalf Emery Wheel Dresser

There is nothing quite so distressing to work on as an emery wheel out of true. Aside from the annoyance there is the difficulty of doing good work on such a wheel.

The Heald Machine Company, 36 New Bond St., Worcester, Mass., in designing the Metcalf Emery Wheel Dresser, took into consideration the disadvantages of other forms of dressers and have prepared a device which will true up an emery wheel in remarkably short time and leave the surface in the best possible condition for rapid cutting.

The circular which the Heald Machine Co. has prepared on their emery wheel dresser will be of interest to every one who has or contemplates buying an emery wheel.

### Witte Engines

The contractor who contemplates hiring another man would do well to buy a well designed gas engine, as by its use he could readily dispense with the services of several men, besides doing his work quicker and better. At the end of a month or two the contractor will have saved far more than enough to pay for the engine and in any future work its earnings will be clear velvet.

The Witte Iron Works, Kansas City, Mo., in their catalog No. 45, instruct the contractor and builder on how to judge engines. The catalog contains minute technical descriptions of the Witte Engines, gives valuable pointers regarding

Advertisers' Section.




## Nine Years' Service and No Repairs

**T**HIS statement was made to us by a carpenter only the other day. An extraordinary claim, we admit, but the tool (one of the first we ever put out) is itself the strongest evidence.

Statements like these prove the success of our efforts — to return to the user Dollar for Dollar in satisfying service.

There are now over one hundred different styles and sizes. Your dealer can supply you.

 The "Yankee" Tool Book tells you all about them. A postal brings it.

**North Bros. Mfg. Co.**  
Department N, Philadelphia, Pa.



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No Contract too Large  
for Capacity of

## THE NORTHWESTERN TERRA COTTA CO.

Nor too Small to Receive  
Proper Attention

Office and Works:  
2525 CLYBOURN AVE., CHICAGO, ILL.

The Only Roof You Can Afford to Consider  
for pleasing results and endless freedom from  
roof troubles and costly repair bills, is

Red **SHELDONS** Purple  
Green **SLATES** Black

The use of any artificial substitute means endless  
expense and dissatisfaction. Our booklet "The  
Reason Why" tells every reason why *Sheldons  
Slates on your roof will put dollars in your pocket.*  
Post a postal and get posted.

F. C. Sheldon Slate Co. - Granville, N. Y.

## DO YOU KNOW

Mr. Home Builder, that the cellar of your residence  
can be made absolutely and permanently watertight  
by the simple application of 1" finish of Portland Ce-  
ment with Bitu-Mortar Waterproofing Compound  
added, over the inside walls and floor?  
Let us tell you about our products.

The Bitu-Mortar Waterproofing Company

**BITU-MORTAR**  
**WATERPROOFING**  
WATERPROOFS PERMANENTLY

Engineers, Contractors and Manufacturers  
340-342 East 27th Street New York, N. Y.



**Make money faster and  
easier than you ever did**

before, by handling W. & C.  
Metal Shingles. We have a special  
selling proposition to make to one live man in  
every town in the country, and its acceptance  
puts the acceptor in a position to make a great  
deal of money very easily.

**Walter's and Cooper's Metal Shingles**

are proof against fire, wind, storm, snow, rain, lightning, rust and  
decay; will not curl, check, split, rot, crack, blow or drop off, and are  
long lasting. Cost no more than wood shingles. Ask for catalog  
and selling plan.

National Sheet Metal Roofing Co., 339-345 Grand St., Jersey City, N. J.

their installation and use and will enable  
the contractor to select the particular style  
and size of engine best suited for his work.

The use of gasoline engines, not only in  
the shop, but on the job, not only by the  
contractor but by the farmer, not only for  
continuous use, but for occasional service,  
makes this catalog of great interest at this  
time. The catalog is beautifully prepared  
and is designed to give the fullest informa-  
tion regarding the Witte engines and will  
be sent to our readers on request.

### From Sill to Shingle

The A. T. Stearns Lumber Co., 25 Taylor  
St., Neponset, Boston, Mass., make a spe-  
cialty of furnishing all of the material lum-  
ber, shingles, siding, trim, etc., for any  
structure from a bungalow to a sky-scraper.  
Their methods and facilities enable them  
to make complete shipments of the entire  
equipment. This will mean a great saving  
in time as well as in price to those who take  
advantage of prices while their quality is  
insured by the large volume of business  
which they do.

The A. T. Stearns Lumber Co. have val-  
uable pamphlets which every builder should  
have. It will give details of their methods  
of doing business, as well as prices, freight  
rates, etc.

### The Smith Mixerette

The Smith Mixerette is the latest addition  
to the non-tilting line of Smith Mixers. It  
is the answer to a demand which has mani-  
fested itself during the past two years for  
a light, portable and inexpensive mixer of  
small capacity. The Mixerette, holding 5  
cubic feet of dry sand, stone and cement,  
or 3 cubic feet of mixed concrete, will pro-  
duce 5 cubic yards of mixed concrete per  
hour—just what is needed by contractors  
for the small concrete jobs.

While the Smith Mixerette embodies  
Smith quality and retains the high standard  
of construction and design, which were in  
evidence in the big Smith Mixers used on  
the Keokuk Dam, at Arrowrock, on the  
Sea Wall and Causeway at Galveston, on  
the Key West Extension of the Florida  
East Coast Railway, on the New York  
Aqueduct, and elsewhere, it likewise em-  
bodies new features which are bound to  
make it as famous as its big brothers.

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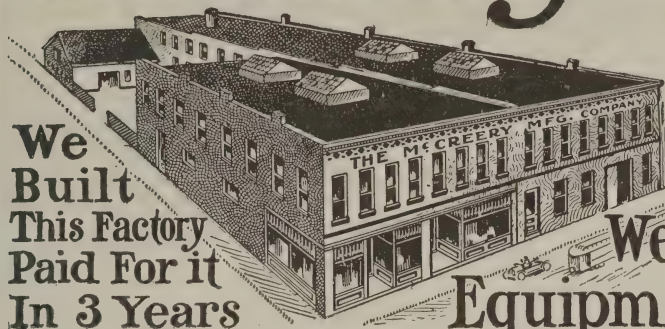
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# Own a Factory like this You Can

**We  
Built  
This Factory  
Paid For it  
In 3 Years**



**We will furnish  
Equipment Free**

## ANY AMBITIOUS MAN OR WOMAN SHOULD SUCCEED

Requires no experience—we start you in business in your own town. Show you how to grow prosperous in the canvas glove business. The demand is enormous, continuous, never failing—everybody, everywhere, wears canvas gloves—the farmer, mechanic, doctor, lawyer, the laborer—*millions* of canvas gloves are required to supply the demand; they have revolutionized the glove industry.

**You Can Start** making money from the beginning—profits are immense. Cost of production and maintenance of business, small. We borrowed money a few years ago—to start—began with two sewing machines—today we employ many men and women—are independent and prosperous.

### Our Great Free Offer

We furnish you the tools *free*, assist you to start a factory, co-operate with you to successfully conduct the business, give you the benefit of our experience, make it almost impossible to fail.

You become really *a branch* of the McCreery Mfg. Co., working independently. We furnish the raw materials, you turn out the finished product, reap the profits.

There are no strings to our offer; you are not bound by any contract to buy from us, only a man to man agreement—that so long as our prices are as low or lower than you can get elsewhere you will buy from us, that's all.

**There is a Market** right in your locality—you can supply it. Every merchant and store keeper for miles around will buy their canvas gloves from you; they want to patronize home industries—you can meet competition, you can sell as cheap or cheaper than they can get elsewhere. Besides we furnish you names of over 700 jobbers and dealers who buy canvas gloves.

### We Tell You All About the Business

in our interesting booklet. How we can help you to start for yourself, to become a successful business man or woman. How we can furnish tools, equip you in the manufacture of canvas gloves, *free*. All this is told in the booklet.

We have confidence in your ability to succeed; all that is required is ambition, a progressive get-what-you-go-after-spirit and determination to make good. It costs you but a postage stamp or a postal card to learn more of this great opportunity.

Write today for book, don't delay. Only a limited number of equipments will be offered *free*. Full information is yours for a post card. Send it now.

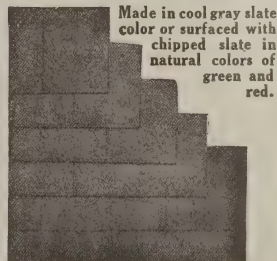
**MCCREERY MANUFACTURING COMPANY, 1059 Front St., Toledo, Ohio**

## The Winthrop TAPERED Asphalt Shingles

Winthrop Asphalt Shingles have all the durability of asphalt and the light weight of shingles. They're **fire resisting**—weather proof—wind and sun proof and never break or blow off. Fully guaranteed. Write for agents' proposition. Specify and buy them for every job.

### The Winthrop Asphalt Shingle Co.

Factory: 102 61st St., Argo, Ill. Office: 1415 Association Bldg., Chicago



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# GENUINE BANGOR

This Roofing Slate will answer every roofing question; it is long-lasting, economical and ornamental.

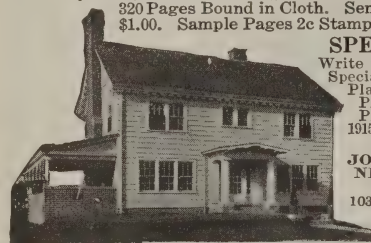
Our large facilities allow low prices and prompt deliveries of Roofing Slate, Structural Slate and Blackboards. Write us for details.

**East Bangor Consolidated Slate Co.**  
East Bangor, Pennsylvania

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A WONDERFUL BOOK ON HOME BUILDING

containing 128 New House Plans, Illustrations of Interiors and Exteriors and Information on How to Finance, Plan, Build and Equip your new Home. 320 Pages Bound in Cloth. Sent Prepaid for \$1.00. Sample Pages 2c Stamp.



**SPECIAL**  
Write today for our Special Short Time Plan Offer. Stock Plans at Half Price to Feb. 1, 1915.

**THE JOHN HENRY NEWSON CO.**  
Architects  
1034 Williamson Building  
Cleveland, O.

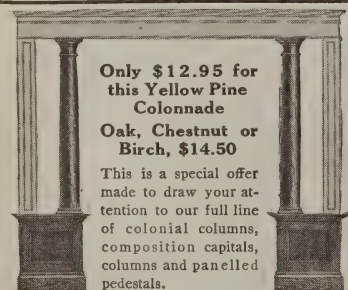
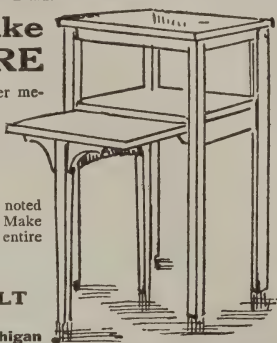
## Easy-To-Make FURNITURE

Every cabinet maker, carpenter mechanic, manual training teacher and student should have a copy of our big portfolio, 100 designs, drawn to scale, the work of recognized progressive designers.

This portfolio covers designs noted for simplicity of construction. Make one piece and save cost of entire portfolio.

Price only \$2.00 postpaid.

**CRATER & HOLT**  
41 National Ave.  
Grand Rapids - Michigan



Only \$12.95 for this Yellow Pine Colonnade

Oak, Chestnut or Birch, \$14.50

This is a special offer made to draw your attention to our full line of colonial capitals, columns and panelled pedestals.

### Contractors and Builders

will find it to their interest to take immediate advantage of our special introductory offer. We carry in stock a full line of colonnades and columns. Prompt shipment and quality guaranteed.

Write today for prices on your requirements.

**The Booth Column Company**  
464 Buckeye Street - Toledo, Ohio

Two features stand out very prominently. The main drum ring and driving pinion are entirely enclosed and protected from the finest particles of dirt or dust. The drum ring itself combines a large gear, encircling the drum, and two machined tracks. The dust-proof casing which covers the drum ring has two machined surfaces which fit snugly over the two machined tracks encircling the drum. This forms the bearing surface upon which the drum revolves. This sliding bearing eliminates main rollers and other supporting and driving mechanism. The lower portion of the casing coming down to the truck sills, forms a supporting pedestal for the drum.

The dust-proof casing is fitted with pressure grease cups so that the machined surfaces can be kept cool and clean at all times. This excludes the dust and doubles the life of the mixer itself. This new feature will appeal particularly to the many contractors who have continually had trouble with their main roller tracks developing flat spots and the main rollers themselves wearing out rapidly, thus causing a wobbly, uneven motion of the drum which will rapidly wear out the driving pinion and at the same time cause a great loss of power on the machine.

Another big feature on the Mixerette is the famous "ropeless" loader, the skip being raised by means of gears. There are no cables to break and no sheaves to get out of order, consequently none of the jerking, twisting motion of the ordinary pivoted hopper, and no binding strain on the loader frame. It lifts easily and smoothly, being controlled by the jaw clutch and the brake. When the skip reaches its highest point, discharging into the drum, it strikes a projected finger which automatically disengages the hoisting clutch, thus preventing any straining or damage to the hoisting mechanism.

The Mixerette is operated by a high-priced, hopper cooled, gasoline engine, enclosed in a steel house, and thus fully protected against any damage.

The drum is equipped with three deep, scoop-like blades, which in connection with the long, steep angle discharge spout, insures an exceedingly rapid discharge.

The equipment as shown is light and portable, weighing only 2,500 pounds.

For the contractor who does not want to

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White Marsh Valley Country Club, Chestnut Hill, Pa., roofed with Asbestos "Century" Shingles by J. Owens, general contractor, Philadelphia, Pa.

## Asbestos "Century" Shingles

*The Artificial Roofing Slate that Outlives the Building*

ALL over the country we find a general feeling that good times have come. Business is looking forward to a most prosperous year.

One thing is certain. At a time when purchasers are most alive to the buying power of a dollar in *value* and *service*, we find our business growing, and growing fast. Asbestos "Century" Shingles are more firmly established than ever as a roofing material of unusual durability—with a national reputation for service and value not en-

joyed by any other natural or artificial roofing material.

The mind of the property owner is wide open on the subject of better materials for his money.

We urge it upon every contractor to be ready to furnish his clients with Asbestos "Century" Shingles—and to feature the fact that he is prepared to give this highest value and service in roofing materials.

Write us for terms and trade prices.

**Keasbey & Mattison Co., Factors**  
Dept. H, Ambler, Penna.

*Branch Offices in Principal Cities of the United States*

## A Square Deal

is all you want. Just a chance to show what stuff you are made of. But, remember, there's one thing that counts, **TRAINING**.

Get the RIGHT training right. If you've never had the advantage of a first-class knowledge of building, plans, specifications, estimating, contracting, etc., then here's your chance. Our "Chicago Tech." Day and Evening Schools have hundreds of carpenters, builders and men of the building trades who are studying under the expert teaching of Chicago's leading architects, estimators and contractors. If you cannot attend these Day and Evening Classes, you can study the same work at home by the "Chicago Tech." method. Our new, quick, easy plan to qualify you in a short time by home study.

**Better things are in sight.**

**Mark and Mail this Coupon NOW!**

WE FURNISH  
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A COMPLETE  
**\$15.00**  
DRAWING  
OUTFIT

Mark "X" opposite work in which you are interested. Without obligation on you we will send full information free.

- |   |  |
|---|--|
| <input type="checkbox"/> Architectural Drafting | <input type="checkbox"/> Building Superintendence  |
| <input type="checkbox"/> Builders' Course       | <input type="checkbox"/> Structural Steel Drafting |
| <input type="checkbox"/> Estimating             | <input type="checkbox"/> Structural Steel Design   |
| <input type="checkbox"/> Plan Reading           | <input type="checkbox"/> Reinforced Concrete       |
| <input type="checkbox"/> House Planning         | <input type="checkbox"/> Machine Drafting          |
| <input type="checkbox"/> General Contracting    | <input type="checkbox"/> Machine Design 1018       |

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PRINT PLANS  
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WITH  
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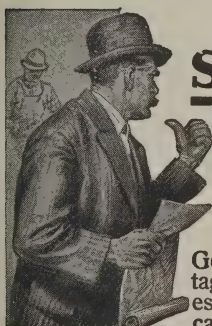
**CHICAGO TECHNICAL COLLEGE**

1018 LAKE VIEW BUILDING, CHICAGO, ILLINOIS

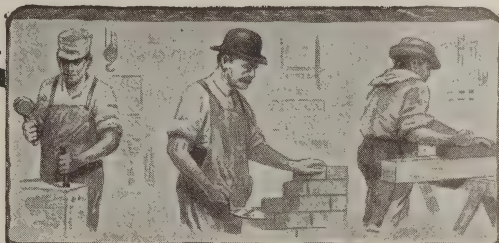
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Who GIVES  
Orders





## Earn \$2400 a Year



Mr. L. L. Cooke

Big demand everywhere for DRAFTSMEN. Salaries from \$125 to \$200 monthly. I will personally instruct you to become a competent draftsman—I am an expert and can easily and quickly train you fully—experience unnecessary. Earn while you learn in spare time.

### FREE OUTFIT

Complete \$17.50 Drafting Outfit furnished free.

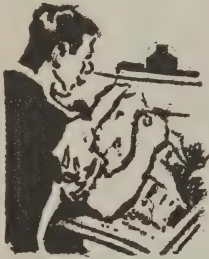
### Write For Free Book

Your name and address on a post card. I will send you my big free book "The Road to Success" and free offer. No obligations.

Chief Engineer, Chicago Engineering Works, 430 Cass St., Chicago, Ill



## Draw Perspectives —and Earn More Money



Building contractors able to make their own perspectives can increase their profits by effecting a valuable saving in time and money. We teach it *thoroughly*.

As a *business*, this work offers excellent opportunities—men earn big salaries. More offers of positions than graduates to fill them. Write for free prospectus.

School of Applied Art  
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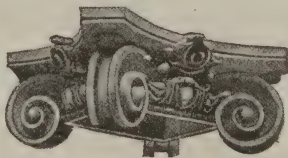
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invest the money in a power charger equipment as shown, the Smith Company furnishes the Mixerette equipped with gated hatch hopper. Such a rig weighs only 1875 pounds, and with its low feed level of 3'-10 1/4", is an equipment which will appeal to a great many contractors.

Briefly summarized the eight principal features of the Smith Mixerette are as follows:

1. Rollers can't wear out. There are no rollers on the Mixerette.

2. Roller Shafts can't bind or get out of alignment. There are no roller shafts on this machine.

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6. Drum cannot clog if given half a chance. There are only three blades, with no sharp corners. The materials scour the drum surfaces clean as a whistle.

7. The GEAR DRIVE prevents buckling and twisting of the loading skip. You can't raise it too high because of the automatic knock-off.

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Special booklet illustrating this machine will be furnished by the T. L. Smith Company, 3124-AA Hadley Street, Milwaukee, Wis., on request. Ask for catalog No. 118-AA.

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Nearly every month Hewitt-Lea-Funcik Co., the big Direct-to-User Lumber concern of Seattle, Washington, spring something new.

A month or so back, the new thing was the H-L-F patented Stud and Wall Board Construction, which is a perfect substitute for back plastering at a very big saving in time and expense.

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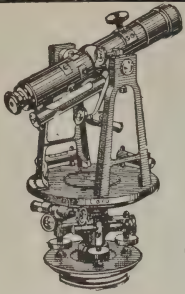
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## Builder's Transit

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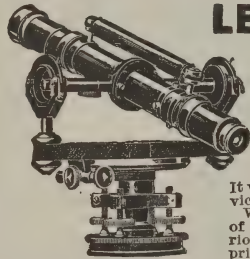
which is ruled off in squares to scale, making it easy for the carpenter to sketch out to dimensions the floor plans of any house he has in mind.

On the opposite side of the sheet are a number of questions which the carpenter fills out.

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## THE STEEL SQUARE

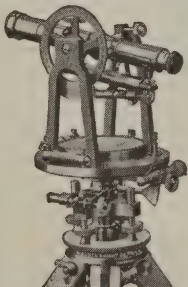
Two Volumes. A practical treatise on the use of the Steel Square. By Fred T. Hodgson. 600 pages, 500 illustrations. The author was the first—really the only—to write on this important tool, and the two volumes contain the easiest as well as the latest method of using the **Steel Square** for the solution of the many problems in building construction. The two volumes are of the greatest value to the young carpenter. Single Volume, Part I, cloth...\$1.00  
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## Making Disston Hand Saws

A most interesting booklet has just been issued by Henry Disston & Sons, Philadelphia, Pa., the subject being "How a Disston Hand Saw is Made." The various operations from the manufacture of the steel to the final handling, packing, and shipping is described in detail. The booklet will be of interest to every one who uses a saw as it will show the infinite care taken in every step of the process by the Disston Co.

The booklet is interesting as showing how much of the work is skillful hand work, indicating the care which is taken to have every saw perfect in every respect.

This booklet will be sent to those of our readers who care to learn more how their tools are made, while we understand that dealers may secure copies with their imprint on them for distribution.

## Accuracy on the Job

Accuracy is demanded of the contractor in laying out his work, in erecting and finishing it. The proper materials must be used and the work kept to the exact measurements. In the concrete work heretofore, too much has been left to chance, and the result has been that many concrete jobs have been put in with a scarcity of cement in some places and an over abundance in others due to the carelessness of the men who were supposed to attend to the mixing.

This difficulty has been entirely overcome in the Eureka Mixer, made by the Eureka Machine Works, 18 Cass St., Lan-

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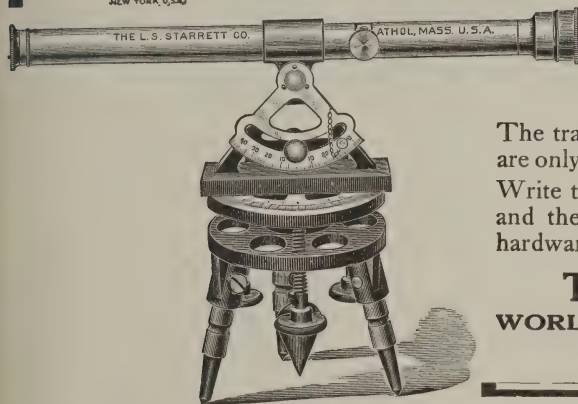
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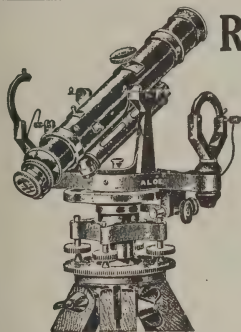
Our instruction book which we furnish with this instrument enables any carpenter, builder or contractor to do any ordinary work of this kind.

The transit has no complicated devices which are only necessary for special engineering work. Write to us now for our free catalog No. 20M and the transit instruction book, or ask any hardware dealer about it. **The price is only \$28.**

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sing, Michigan. Automatic devices insure that only the proper mix will be used, provided the hoppers are kept supplied with the necessary ingredients. Another feature of the Eureka Mixer is that the ingredients are thoroughly mixed dry, before any water is added, thus giving a much better mix.

The Eureka Mixer is made in a variety of styles and sizes which are fully shown in the catalog which the Manufacturers will send on request. This will permit the contractor to select the mixer best suited to his particular work.

---

### Detroit Levels

The best mechanic who ever lived had to have a level to insure accuracy in his work. Consequently every workman must have a level. It is more necessary in a way than any other part of the workman's equipment for by it the accuracy of the entire job is determined. A carpenter may be able to drive nails with speed and skill but unless the work lines up it only means doing it over again. The bricklayer may have an eye ever so good, and may be able to lay brick with both hands, but still he needs to check up his work at frequent intervals.

Each trade requires a level a little different from another. As a consequence, the Detroit Level Company, 2328 E. Grand Boulevard, Detroit, Michigan, has designed levels for practically every purpose. The mason has his choice of several styles and sizes, while the plasterer can be likewise suited.

A circular showing the various styles of levels, plumb rules, etc., made by the Detroit Level Co., will be sent to those of our readers who are interested in goods of this character.

---

### Parquetry Flooring

Circular No. 15, issued by the Federal Parquetry Co., 175 Fifth Ave., New York, will give the contractor and carpenter a great deal of information on parquetry flooring. This flooring has heretofore been considered too expensive for the ordinary job but the system by which it is manufactured by the Federal Parquetry Co. enables them to sell it at prices in close competition with other flooring materials. The

finer appearance of this flooring will usually appeal to both contractor and owner, while the great variety of squares, stripes and patterns in which it can be laid will make it popular wherever it is used.

---

### The Green Hudson Asphalt Shingle

Permanence in building materials is always desired but can only be accomplished through careful selection. When wood is protected from the weather, it will last indefinitely, but when exposed to dampness, and to the action of sun, wind, heat and cold, will soon begin to deteriorate.

The Asphalt Ready Roofing Co., No. 9 Church St., New York, in the manufacture of the Green Hudson Asphalt Shingle, have taken great pains to produce an article which will be artistic, fire-resisting, permanent and easy to lay. The samples of their shingle which they are sending out readily convince one that it is far superior to many of the forms of roofing now on the market, while they advise us that their prices are practically the same as wood shingles. The contractor who uses them, however, will find he can lay them faster and that they will mean a saving in fire insurance to the owner. The Asphalt Ready Roofing Co. will be glad to hear from contractors as well as send them samples and other information.

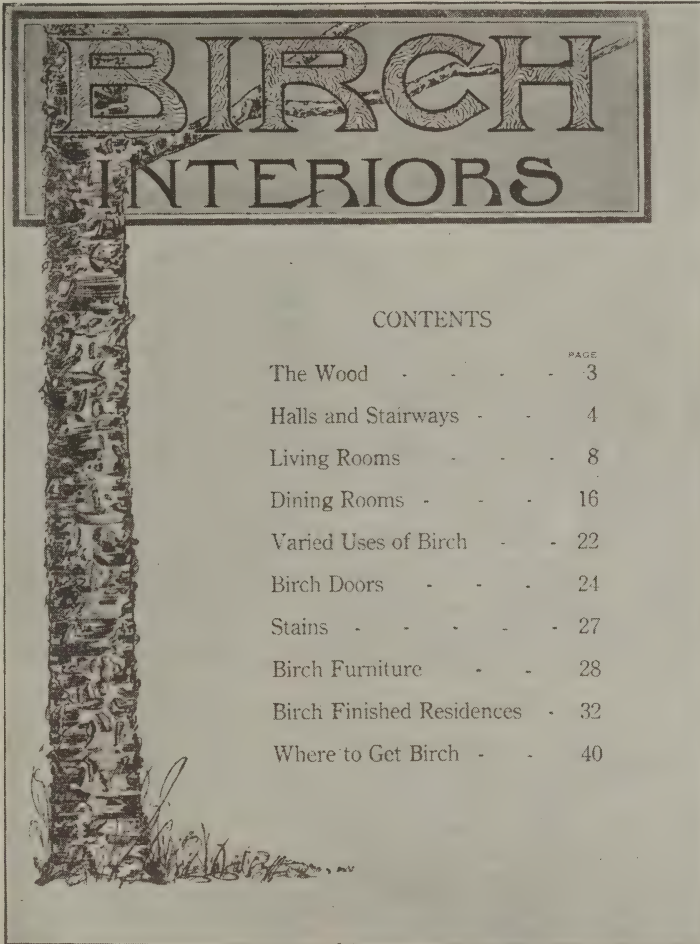
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### Good Winter Work

The Stransky Mfg. Co., Dept. R., 20 Warren St., New York, advise us that those of our readers who have already accepted their proposition for winter work, are finding the idea most profitable. Briefly the proposition is, to equip chairs, tables, sideboards and other movable furniture with the Evergrip gliding castor which allows the piece of furniture to be moved easily from place to place without marring the floor. Those who have been obliged to move furniture equipped with the old style castors will appreciate this device and the use of them on one chair or table easily means their installation in every place where they can be applied.

Those of our readers who have not taken up this matter should investigate it at once.

# The New Birch Book



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**T**HE new Birch Book, the cover of which is pictured above, is now ready for distribution. It is 9 x 12 inches in size, well bound in heavy gray paper and contains 40 beautiful pages illustrating modern halls, stairways, living rooms, dining rooms, fireplaces and floor plans; shows styles of interior finish and color schemes that every architect and builder will appreciate.

Write today for Birch Book "D" and a set of Stained Birch samples. Sent postpaid. *They will help you get business.*

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Dept. D, Wausau, Wisconsin**

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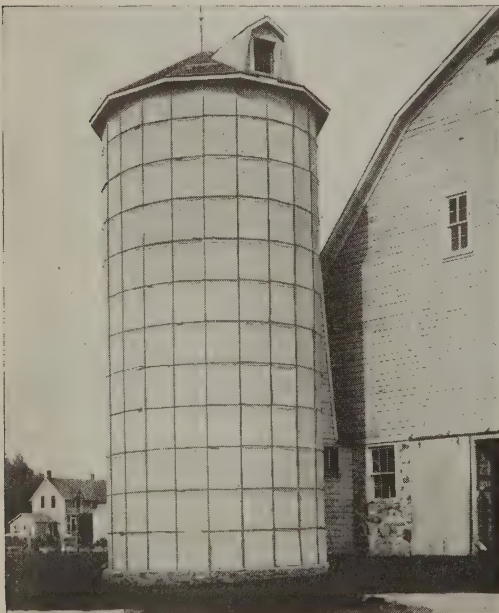


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### The Minneapolis Panel Silo

Silos have become a necessary part of the modern farm equipment. In no other way can so much stock food be cared for and in fact no other food tastes so good to the stock. The decision as to the size of the silo depends entirely upon the number of animals to be fed, but the question as to which kind shall be built must be decided by the individual himself. A good way is to observe what silos the successful farmers in his and other vicinities are building and to guide him in this we are showing three



views of silos built under the Puffer-Hubbard Mfg. Co.'s system. This system consists essentially of upright steel ribs, planking, door frames, doors, hoops and hoop holders, etc. The Puffer-Hubbard Co. seem to have originated a most satisfactory system of silos construction and their catalog shows this system in great detail. It will be of interest to the up-to-date contractors who are going after the farmer's business as well as to the farmer himself. The catalog shows views of a large number of silos already erected, gives letters from satisfied owners and much other valuable information on this silo question.

The Puffer-Hubbard Company, 3214 Twenty-Sixth St., East, Minneapolis, Minnesota, are always glad to hear from contractors and will assist them in designing a silo which will harmonize with the adjoining buildings as well as give the best of service.

## Gas for Country Homes

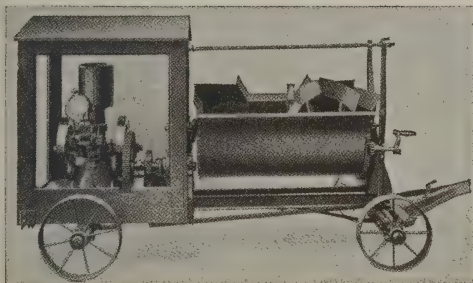
Modern independent gas plants for suburban and country homes of all sizes from the largest to the smallest.

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A saving of \$25.00 per day was made in mixing hardwall plaster for the big Machinery Palace for the Panama Pacific Exposition.

The Cement Tile & Block Mfg. Co., of Osgood, Ohio, paid for their Blystone in three months work in their block plant.

One man slaked lime and made mortar for ten masons and had time to spare for other work on a job recently done by G. Ed Berry, of Harrisburg, Ill. Mr. Berry also says he got 10% more mortar per barrel of lime.

H. A. Farmer, St. Petersburg, Fla., recently wrote us as follows: "I am so well pleased with mixer, I want another just like it. Ship me another one as soon as possible."

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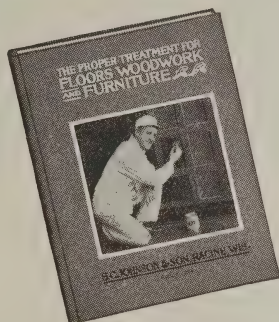
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**T**HIS book is the work of famous experts. It is beautifully illustrated in color. It gives complete specifications for finishing new floors, woodwork, etc., and refinishing old work of this character—covering capacities, etc. Every contractor can profitably read this book.

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contains a larger percentage of the hard expensive polishing wax than other brands. For this reason it covers a larger area—gives a better and quicker polish and insures a satisfied customer. It may be used with perfect results over Johnson's Wood Dye, Paste Wood Filler or any other finish—varnish, shellac, oil, etc.

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made in 17 standard shades for the artistic coloring of all wood—floors, woodwork and furniture. It does not lap or streak—penetrates deeply without raising the grain—is economical and permanent. A trial will convince you. If you have never used Johnson's Wood Dye write us and we will see that you are promptly supplied with good sized samples for experimental purposes. Use the coupon below for free booklet.

Please send me free and postpaid a copy of your 25c illustrated color booklet, "The Proper Treatment for Floors, Woodwork and Furniture."

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Made to last  
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BATTLE CREEK, MICH.



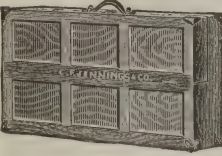
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Illustration of Tool Case No. 35

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## More Work for the Winter

How is it with you?

Contractors have their busy and dull seasons. During the spring, summer and fall, when people spend a great deal of their time out of doors, attention is directed to the necessity or advisability of making repairs and improvements. To this class of work is added the new building and between the two the popular contractor is often at his wits ends to meet demands.

It was with a realization of this condition that the manufacturers of maple flooring proposed a winter campaign, having for its primary object the installation of maple, beech and birch flooring.

It is argued in the forceful book now being distributed to contractors, that putting in a maple, beech or birch floor is a mere incident of the repair and improvement work that can be done in winter to better advantage than at any other time.

A very graphic idea of the change which the adoption of the Maple Flooring Manufacturers Association plan will bring about is shown in the book entitled "More Work for the Winter." In the event readers of this paper have not sent for or have not been supplied with a copy of "More Work for the Winter" it would be a good idea for them to catch the importance of this very profitable message by sending for a copy and by applying the principle expounded.

There actually exists no reason why contractors cannot develop business with the suggestion and aid the Maple Flooring Manufacturers Association are giving and with it, it should be a very easy matter for any contractor to build up a big winter business. All inquiries should be addressed to the Maple Flooring Manufacturers Association, Stock Exchange Building, Chicago, Ill.

## Completing the Home

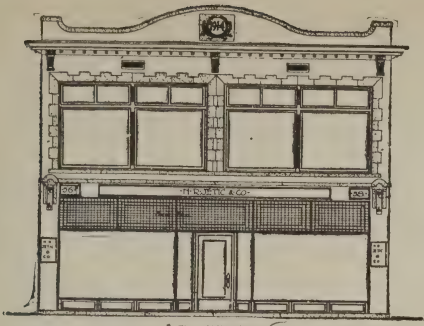
Many old experienced contractors and builders have pointed out the fact that it's an easy thing to cut down the profits on a building by failing to figure in properly the numerous odd jobs which must be taken care of by the builder before a house is ready to turn over to the owner.

In addition to the fact that the outdoor

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## WHEN YOU DESIGN A STORE FRONT LIKE THIS

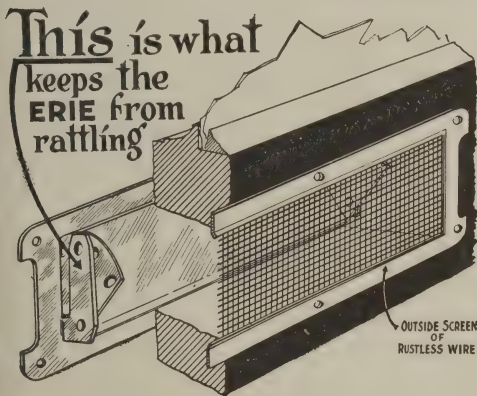
Why don't you just specify "Petz Patent Store Front Construction including ventilated sash shall be used?"

You can leave it to us to provide a modern, sales-getting front — and a front which will get the lowest insurance rate for the plate glass.

Those are the bulls'-eyes for your client's satisfaction.

Send for catalog and put the store front up to us.

Detroit Show Case Co., 481 W. Fort St., Detroit, Mich.



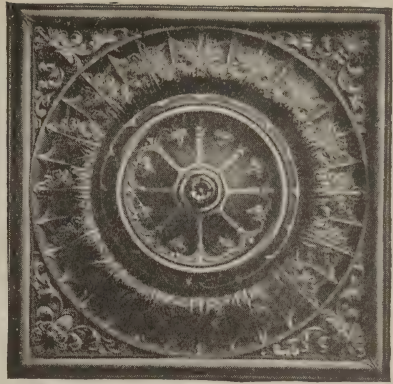
## The Erie Sash Ventilator

fits flush to the window sash over a rectangular vent cut thru the rail. It is made of sheet brass, finished to match all conventional hardware, and rustless wire screen.

☞ Simple, noiseless, efficient, economical.

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Carpenters, contractors and builders, here is a chance for you to build up an independent, profitable business for yourself right at home. Many agents are now devoting their entire time to selling Edwards' Metal Ceilings.

**Big Quick Profits** are being made by others who are simply devoting part of their time to selling and applying

## EDWARDS' Metal Ceilings

Fill in and mail the coupon below today. The territory is going like hot cakes. One day's delay may cause you to lose out. The coupon brings our special agents' proposition and large, handsome catalog of attractive designs.

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430-450 Eggleston Ave., Cincinnati, Ohio

Mail This Coupon Right Now

THE EDWARDS MFG. CO.,  
430-450 Eggleston Ave.,  
Cincinnati, Ohio

Send me details of your agency plan and a copy of your Steel Ceiling Catalog.

Name .....

Address .....

Business .....

PASTE THIS DONE  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



privity is meeting with the same criticism that has been directed by health officials at the cesspool as a menace to health, the live, up-to-date builder is naturally interested in any substitute that is going to be less of a bother and more of a profit to him.

Many State Boards of Health have recommended a definite type of indoor closet and the Ro-San Chemical Closet follows these recommendations. It is an all-metal fixture which may be installed anywhere in any house, store or office, old or new. The vent pipe is passed into a stove-pipe, chimney or outdoors. The contents are rendered harmless by a germ-killing chemical placed in water in the container. This chemical, in addition to destroying the germs, works with the air-circulation to render the closet absolutely odorless. The contents are carried out once in two or three weeks.

Such a closet represents an opportunity for the average builder to turn a loss into a profit. He is able to avoid the excavation of a vault and the erection of an outhouse by installing in the house itself an odorless, sanitary, chemical closet, endorsed by the local health officer. The builder pleases his client, does something to improve general health conditions and makes a better profit on the job. The Ro-San Closet is manufactured by the Rowe Sanitary Manufacturing Co., 201-A Sixth St., Detroit, Mich., who will supply the contractor with any necessary circulars, information, prices, etc.

### An Architectural Aid

Request for good appearance for the interior of the house has led to the use of numerous materials. One of the most satisfactory for the purpose is Arkansas Soft Pine. This wood possesses an endless variety of figure, while there is a harmony between the various pieces. It is satisfactory wood in many ways not the least of which is its ability to take any desired stain or finish.

The Arkansas Soft Pine Bureau, 713 Transportation Bldg., Chicago, Ill., have issued a book on the use of Arkansas Soft Pine, showing the great variety of places where it may be used, and giving colored illustrations of panels finished in various ways. The book will be of interest to every contractor, builder, architect, and draftsman, and will be sent free on request.

### Copper Bearing Steel for Roofing Tin

The American Sheet & Tin Plate Co., Frick Bldg., Pittsburg, Pa., publish an interesting booklet on the effect of copper in steel for roofing tin. From their numerous experiments extending over several years, they believe that a certain amount of copper in the steel will add greatly to the life of the metal. The results of their experiments are given, as well as a great deal of valuable information on how to construct a tin roof, roof painting, standard specifications for tin roofing, weights of the various sizes of sheets, etc. Not the least valuable information is a table showing the cost of tin for flat seam as well as for standing seam roofing. The booklet will be sent to our readers on request and it should prove of interest and value to them.

### The Artist of Today

The work of the artist today is far different from what it was a comparatively few years ago. Art has been commercialized to such extent that the artist is recognized as a necessary part of every undertaking. Photo-engraving calls for artists of skill and no catalog or magazine is complete unless the text is supplemented by drawings faithfully portraying the subjects described. Advertising calls for the exercise of a high degree of art in making up an advertisement which shall appeal to the readers and therefore the artist has a broad field in which his efforts are appreciated.

The School of Applied Arts, Dept. N. B., Battle Creek, Mich., make a business of training draftsmen and students to become money makers. These efforts are not direct to those who follow art and drawing alone, but also to those who can use it in their business. This applies to building contractors who wish to make perspectives so that they may show their clients exactly what the finished building will look like, as well as to others in the building line who wish to study any of the principles of drawing, lettering or designing.

The free prospectus of the School of Applied Art will show our readers how they may obtain an education in drawing which will be of value to them in their business.

# THE BOSTWICK STEEL LATH CO.

INCORPORATED 1891

NILES, OHIO, U. S. A.

Jan. 1, 1915.

To the Readers of the  
'National Builder'-

Gentlemen:-

The National Builder is valuable to you now.

It will be worth more in 1915; 'Bostwick' will assist in making it so.

You appreciate the NECESSITY of more fire-proof building and know that Metal Lath and plaster construction is the most economical with which to get results.

Each succeeding 'Bostwick' advertisement in the National Builder will treat of some phase of Metal Lath construction in a way that will save and make you money.

The April number will give details that it would cost you years of experience and lots of cash to secure.

A convenient portfolio will be furnished you free of charge for keeping permanently all this cost-reducing and profit-increasing information--better write for it early.

In wishing you a very happy and prosperous New Year we advise-

'Watch Bostwick in the National Builder.'

Yours very truly,

THE BOSTWICK STEEL LATH CO.





### The New-Way Air Cooled Engine

There are several reasons for the popularity of the modern gasoline engine. Its dependability, low cost, power, and adaptability are some of them.

Of course there are styles and kinds and sizes. Some adapted to one purpose, some adapted to several.

The New-Way Motor Co., Lansing, Mich., have considered the various requirements to which a motor is subject and they have built their various styles and sizes of engines to meet the needs of practically every contractor, farmer or user of power. Catalog D 14 issued by the New-Way Motor Co. shows the various styles and sizes, made by this Company, as well as indicates some of the many uses to which they can be put. It will be of interest to the contractor whether he intends to use an engine himself in the shop or on the job or whether he intends to sell it to the farmer for operating the various machinery about the place.

### A Profitable Business

The booklet of the McCreery Mfg. Co., Toledo, O., describes in detail the proposition which they are making to our readers. It consists essentially in starting them in business at practically a very small investment for stock and materials and instructing them in the manufacture of canvas gloves.

Everybody wears gloves and many workmen are obliged to wear them practically the whole year around, not only from protection against the cold but also from the materials which they handle.

There is, therefore, a steady market for canvas gloves and there seems to be no reason why this business should not be a profitable one for practically every community. A letter to the McCreery Mfg. Co. will bring complete information regarding their attractive proposition to our readers.

### Hicks Estimating Data Blank

Probably no one man is better posted on estimating than Mr. I. P. Hicks, of Omaha, Neb. Besides supplying the NATIONAL BUILDER with the estimates which have appeared for many years in connection with the supplement sheet, Mr. Hicks has been an active contractor and builder, as well as the author of several books on estimating.

In preparing a new estimating data blank therefore, Mr. Hicks has a wealth of experience to draw from and the blank which he has prepared should be of great assistance to the estimator, builder and contractor. These blanks are now for sale by Mr. Hicks and we understand that he will be glad to send our readers full information regarding them with prices, etc.

### Prying Wood Chisels

Every carpenter is supposed to come on to the job with sharp tools. When he leaves the job his tools are sharp again, and the contractor cannot say a word. But the conscientious carpenter does not take advantage of the contractor in sharpening his chisels or saws. In fact, some of them are still going to the blacksmith and getting specially made prying wood chisels. These chisels are not made to take the place of wooden handled chisels but are intended only for prying off interior trim and rough outside work.

Carpenters prefer prying wood chisels to the "Jimmy" or short crow bar, which is much heavier to carry; is much bulkier and therefore, harder to find a place for in the tool chest. But it takes time to put in special orders for any kind of tool, besides it is no longer necessary, for the Rehm Hardware Co. is carrying in stock the new "V & B" Prying Wood Chisels.

These chisels are made in six sizes,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  inch blades and are 12 inches long. They are made of extra refined steel, are oil tempered and have polished and knurled handles.

The Rehm Hardware Co., state that every carpenter buys who gets one look at these chisels. They all appreciate that it is no longer necessary to knock the cutting edges off their favorite wood chisels to pry off trim, etc.

They all prefer to invest a little money in one or two of these handsome and useful pryers, rather than spoil their chisels and waste an hour or so on the job, sharpening them up afterwards.



# Let Us Start You In Business

## Absolutely No Experience Required

to start in this wonderful manufacturing business. **We instruct you free**—our booklets teach you the road to success—the machine is simple to operate—a boy can do the work. Here is your chance to **BE INDEPENDENT**. There are **big contracts ready for you** no matter where you live and builders are turning to this brick to lower the high cost of building.

**More than 33,000,000,000 brick** used every work day of the year. This tells you how enormous is the demand. Contractors are crying for more brick. **You can supply the demand** in your locality. You can start in business—be a manufacturer of pressed cement brick and make money from the start with but very little money.

## \$2,430.00 In 90 Days

The money one man made in three months with a Helm Press in a little town of 375 inhabitants. Just think of it—this is realizing a big opportunity and grabbing it quickly—look around you in your town—see how concrete has taken the place of other building materials.

Doesn't it tell you that this is your opportunity—your chance to get on the ground floor? **\$10 to \$50 a day easily made** with a Helm Press. Making a product as staple as sugar and certain of demand as clothes for your back—concrete must take the place of the fast disappearing wood, stone and clay.

## See What Other Men Say and Do

Wm. Wilson, Wisconsin, writes: "I operate the press with four men and make **5,000 per day**. The total cost of one day's output, including labor and cement, is **\$21.80**. The brick sell for **\$10.00** a thousand, and this brings me **\$50.00** for the day's output, leaving me a profit of **\$28.70** every day I operate."

Lacey D. Gregory, D. C., writes: "My Brick Press is a wonder. **I am turning out 4,000 brick a day** with one man's assistance. It has only cost me 50 cents for repairs in two years. Am building up a fine business."

Here are extracts from a dozen others:

"Have contract for 240,000 brick at **\$15.00** a thousand at factory, to be shipped 200 miles for a five-story building."  
 "I landed a **\$90,000 government contract** with Helm pressed cement brick." "Just landed a contract for 400,000 Helm pressed cement brick."  
 "We are working on a contract for half a million pressed cement brick."

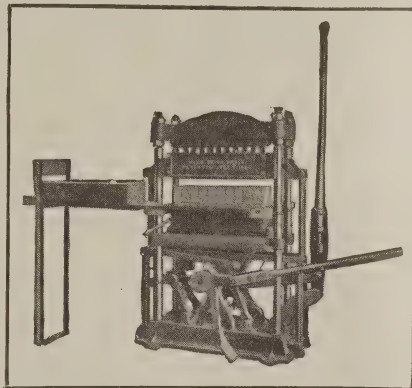
## Start With Little Capital

It is simply astounding what little capital is required to start a business like this—one of the fastest money makers in the country. The machine makes pressed cement brick and blocks under 80,000 pounds pressure. **No tamping—easy work**—maximum capacity 10,000 bricks daily—no burning required. Somebody in your neighborhood is going to grasp this opportunity. Why not you?

No matter what other cement products are made there, these brick blocks made by pressure will be in demand. The possibility of failure is almost eliminated. **Success is practically a dead certainty.**

## You Can Own a Factory

You can be a manufacturer of pressed cement products and have a factory. You can make clear from **\$10 to \$50 a day**.



You can do it just as well as anyone else. We want you to know more about these manufacturers who are running a big business and making big money. We will show you how to do it with very little capital.

Single buildings often take from a quarter million to a half million brick. This must convince you of the wonderful possibilities now open for starting a plant. You want to know all about it.

Fill in the coupon. **Mail it today** and we will send free, complete information about the Helm Press—how, when and where to make money with it. Write **now** before some one else in your town gets ahead of you.

**HELM BRICK MACHINE CO.,**  
 181 Mitchell St., Cadillac, Mich.

Gentlemen:—Please send me your free booklet on the Helm Press and how I can make money in the brick and block manufacturing business.

Name .....

Address .....

Town ..... State .....

**Helm Brick Machine Co.**  
 181 Mitchell St. Cadillac, Mich.

PASTE THIS DOME  
 WRITE TO ADVER-



ON LETTERS YOU  
 TISERS. IT HELPS.



The illustration shown here is the 1½ inch blade. All sizes and prices are given in the October issue of *Rehm's Hardware Bulletin*. These Bulletins are mailed free to carpenters, contractors and builders who want them. They are jammed full of real bargains in nails, lock sets, casement fasteners, shingle brackets, barn door hangers, cupboard turns, etc. Of course, when writing to the *Rehm Hardware Company*, 1503 Blue Island Ave., Chicago, ask for their *Builders Catalog* and net price list too.

### Sanitary Barn Fixtures

No dream ever appeared so realistic as the day-dream of the would-be farmer who calculates, on paper, on what he can do with a few acres, a few chickens, a few cows, a few peach or apple trees. Geometrical progression fails to provide numbers enough to represent the increase and the profits. Nature however, has a peculiar way of setting a limitation on these things and the sequence is rudely interrupted. What can be done with a dozen chickens or with two or three cows cannot be repeated with a thousand chickens or a hundred cows. There is a slip-up somewhere.

Government statistics indicate that only about one cow in three is really making any money for its owner. Of the other two-thirds, one-half of them are being kept at an actual loss while the remainder are barely paying for their board.

The reason for these conditions have been found with more or less satisfaction by many investigators who have gone carefully into the subject. Possibly no phase of the dairy business shows greater results for the money invested than up-to-date scientific barn equipment. Stantions, stalls, pens, feed and litter carriers, ventilating systems, etc., must all be carefully proportioned for the number of animals to be cared for and this makes every installation an individual one.

The *C. A. Libbey Co.*, 182 Marion St., Oshkosh, Wis., have given these matters careful study and have designed equipment for the complete dairy project. They have just issued a large and complete catalog showing their goods and will be glad to send this catalog to any architect, contractor or carpenter who may be interested in receiving it. Every barn builder should have the

catalog as it will be the means of posting them on numerous technical farm questions, which would otherwise be difficult or expensive to study out by themselves.

### Beaver Board

The use of Beaver Board made by the *Beaver Co.*, 202 Beaver Road, Buffalo, N. Y., has become so general that the manufacturers have seen fit to get out a number of valuable and instructive booklets. One of these entitled *Beaver Board Handicraft* shows many useful and artistic household articles made from Beaver Board such as, screens, sewing tables, waste baskets, portfolios, book racks, shirtwaist boxes, medicine cabinets, doll houses, etc. Complete instructions are given for making these various articles and the amateurs will have no difficulty in fixing them up in the most artistic manner.

Another booklet gives the specifications for painting Beaver Board, giving a wide variety of finishes.

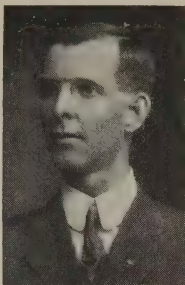
There are so many places where Beaver Board may be used that a much larger booklet shows a few of its applications. The *Beaver Co.* advises us that they will be glad to send to our readers the particular books which they can use to advantage and will advise them regarding any particular job which they have in mind.

### Building Materials Made of Rock

The marked increase in disastrous fires is directing more attention every day to the need of fireproof building materials that can be relied upon. The failure of many so-called fireproof materials when subjected to the intense heat of large conflagrations suggests the need of more careful judgment in the choice of these materials as well as a more stringent interpretation of fireproof building regulations.

The demand for building materials that would not be affected by fire has encouraged manufacturers to experiment with all kinds of materials, but the only one that has thus far successfully withstood all tests is a peculiar rock known as *Asbestos*.

*Asbestos* runs in veins usually nearly parallel to the ground, in various thicknesses from a mere line to three or four inches thick. Some of these veins, how-



W. L. GILLUM

Cuba, Mo., Dec. 11th, 1914.

Polk-Genung-Polk Co.,  
Fort Branch, Ind.

Dear Sirs:—Replying to your inquiry of the 9th inst. I am glad to give you my experience with the Polk System of silo construction. Previous to my connection with you, I worked as a draftsman at \$75.00 a month. In May, 1914 I became a helper on several Polk System Silos. I then secured a machine and erected three silos myself in seven weeks, at a BIG PROFIT and at the same time my customers were well pleased for they have a permanent silo whose capacity cost them less per ton than they would have to pay for a wood stave silo.

The outlook for 1915 is very bright and full of promise for I am confident the PERMANENT CONCRETE SILO will rapidly replace the temporary types of silos. I believe this business is the one best bet today.

You may use this letter as you see fit, and I will be glad to answer any inquiries that may be made of me.

Yours very truly, W. L. Gillum.

### To Whom It May Concern:

In eight years we have built up from nothing one of the most successful businesses in the country.

We have just completed a brand new factory covering, all told, half a city block, equipped with the very best machinery of the most up-to-date type, including oxyacetylene welders, electric spot-riveters, etc. We use only the most efficient machinery regardless of cost.

We have worked hard and used our heads in building up this business. We embarked on what is today perhaps the most profitable business in the building field. Uncle Sam is boosting it with all his might. Every Agricultural College and every State University is boosting it. Every Land Department of every Railroad Company is boosting it. So is every Farm Journal published. The fact is, the silo is proving the salvation of American farming.

Men who have become associated with us, erecting monolithic concrete silos with Polk System Machines, have shared our success. If our business were a thousand times as large as it is, it would still be very small compared with the field and the growing demand.

The backbone of this country is agriculture, and the backbone of American agriculture is the silo. Polk System Silos are absolutely the best that can be built. "They are not built of pieces and they cannot go to pieces."

Opportunity may knock at your door more than once, but Opportunity will not knock forever. We invite you to join us in a business that we have found to be profitable. We court the closest investigation. Our business is safe, profitable and the most independent in the building field today. And the scope is unlimited.

### REDUCED PRICES

From NOW until Feb. 17, 1915 (closing date of Chicago Cement Show) we will reduce prices on our Polk System Machines. We do this in order to get 100% efficiency from our new plant, by running "full blast" during the winter months. Contracts must be made by Feb. 17, but delivery of machines will be made at any time this winter, next spring or next summer, to suit purchaser. Write at once for Special Winter Sale proposition, which gives you reduced price and exceedingly easy terms.

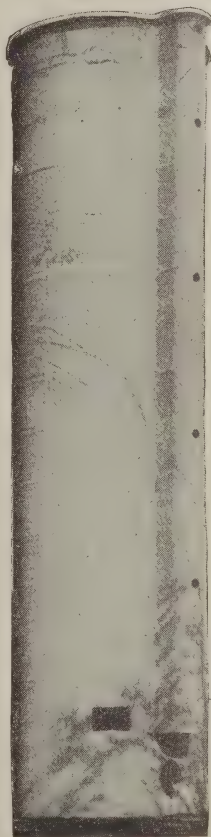
**Polk-Genung-Polk Co., Fort Branch, Ind.**

# This Man Made Big Profits

Mr. Gillum's letter speaks for itself. This case is only one out of scores. Many have done even better.

Never before in the history of the country has there been such a profound interest in the silo system of preserving green food for cattle, swine, horses, poultry and all live stock. One of the leading dairymen in Ohio recently said: "without the silo I could not continue in business." There are tens of thousands of farmers who want silos, now, and scores of thousands who need them and will want them in the future.

The Polk System Silos, built of re-enforced monolithic concrete are absolutely the best silo that can be built. They stay put. They can be built to any height, perfectly perpendicular with uniform thickness of walls, and at a saving of forty per cent of the usual cost of monolithic concrete construction.



16x60 Polk System Silo  
Illinois State Fair  
Grounds, Springfield, Ill.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



ever, reach a depth of 200 feet. In mining this rock, after removing the surface of the earth, the rock is drilled and blasted the same as granite or any other stone.

Deposits of Asbestos, in one or more of its allied species, are found to a limited extent in Russia, Italy, Egypt, India, South Africa and, in fact, in all parts of the world. But that which is mined in Canada is about all that is of much commercial value, as other varieties are either too brittle to utilize or too hard to mine. By far the largest of these Canadian mines is owned by the H. W. Johns-Manville Co., of New York.

This Asbestos rock, when properly worked, produces long silk fibres, which are manufactured into fireproof goods of various kinds, the most familiar of which, no doubt, is the Asbestos Theatre Curtain.

These Asbestos, or rock fibres are made into felt, much along the line that the felt for hats is manufactured. This felt is then saturated with Trinidad Lake Asphalt, after which several of these sheets are cemented together with this material and thus made into ready roofings.

For shingles, these same rock fibres are mixed with Portland Cement and other ingredients, put into moulds of various sizes and shapes, and subjected to intense hydraulic pressure. The various colors are mixed with these ingredients, producing shingles of a number of handsome shades.

Asbestos Wood or Lumber is also made in very much the same manner as the Shingles. This is furnished in slabs of varying sizes, so that it can be easily used for making fireproof partitions, fire doors, booths for moving picture machines, etc.

Another use that is made of this material is in Stucco, also Wall Plaster. Here the Asbestos fibres take the place of hair ordinarily used and the Asbestos rock takes the place of sand.

Then there are pipe coverings and a number of other things used in building construction made of this peculiar material.

Another material which is fast gaining favor, chiefly because of its fire retarding qualities, is Mastic for floors.

The importance of fireproof construction can not be over estimated, and that

architects and builders are fast realizing this is shown by the big increase in the substitution of fireproof building materials for those of an inflammable nature.

### November Building

Building statistics for November make a poor showing, but it is not so bad when one takes into consideration the fact that the principal cities of this country have for months and years been piling up a tremendous increase over the previously corresponding period.

Permits were taken out during the month just closed in 93 cities, according to official reports to CONSTRUCTION NEWS, for the construction of 15,642 buildings involving a total estimated cost of \$36,186,915, against 17,814 buildings involving \$50,008,632, a decrease of 2,172 buildings and a decrease of \$13,821,717, or 27 per cent. The figures in detail are as follows:

Cities.	1914		1913	
	No. of Estimated Bldgs.	Cost	No. of Estimated Bldgs.	Cost.
Chicago .....	840	\$ 6,513,150	840	\$ 6,491,000
Boston .....	418	3,234,000	429	5,905,900
New York (Boros and Bronx) .....	526	2,506,257	708	4,538,351
Cleveland .....	843	2,153,645	670	1,241,640
Brooklyn .....	748	1,617,445	857	2,309,415
Philadelphia .....	858	1,240,530	1,063	2,026,565
Detroit .....	...	1,103,580	554	1,803,710
San Francisco .....	498	998,587	447	1,142,986
Los Angeles .....	682	785,310	1,155	1,200,158
Pittsburgh .....	118	777,368	228	698,617
St. Paul .....	170	710,697	156	647,682
Minneapolis .....	363	703,615	374	820,990
St. Louis .....	604	650,029	654	1,073,643
Peoria, Ill. ....	49	605,200	51	184,600
Milwaukee .....	236	591,583	273	1,454,410
Buffalo .....	273	498,000	275	580,000
Portland, Ore. ....	318	453,830	484	608,865
Worcester .....	105	424,124	114	299,688
Washington, D. C. ....	372	419,544	313	644,033
Hartford .....	83	399,385	94	1,071,045
Rochester .....	214	397,830	229	649,575
Columbus .....	141	377,385	175	398,770
Newark .....	158	373,627	198	549,371
Allentown, Pa. ....	16	366,035	25	91,800
Bridgeport .....	60	364,859	58	239,684
Kansas City, Mo. ....	220	341,220	277	934,672
Cincinnati .....	990	336,210	903	466,050
New Haven .....	102	315,755	60	214,475
Oakland, Calif. ....	244	281,769	217	414,226
Toledo .....	168	276,676	164	283,555
Baltimore .....	168	274,980	320	612,796
Tacoma .....	85	270,655	111	63,520
Indianapolis .....	358	265,190	320	479,711
Cedar Rapids, Ia. ....	45	250,000	31	497,000
Syracuse .....	139	235,365	100	182,330
Seattle .....	589	229,615	646	387,790
Atlanta, Ga. ....	239	228,104	329	278,904
San Antonio .....	137	210,575	237	102,800
Springfield, Mass. ....	94	197,503	94	951,295
Duluth .....	94	189,510	109	204,675
Akron .....	114	179,395	128	173,135
Grand Rapids, Mich. ....	125	171,425	125	275,384
San Diego .....	166	168,163	250	263,861
Berkeley .....	89	162,200	75	205,500
New Bedford .....	58	144,700	81	254,492
Denver .....	235	134,410	167	155,129
Dallas .....	79	133,850	189	876,615
Omaha .....	72	133,583	116	268,590
Memphis .....	172	133,275	237	211,271

**Practical Bungalows and Cottages for Town and Country.** By Fred T. Hodgson and E. N. Braucher. 420 pages, 400 illustrations. Perspective views and full plans of over 200 bungalows, cottages, houses and flat buildings costing from \$500 to \$3,800. Every plan was made by a licensed architect and has been built within the estimated cost. A number of attractive California bungalows, all low cost. Cloth.....\$1.00

**Dustman's Book of Plans and Building Construction.** By U. M. Dustman. Contains plans for 150 modern houses, bungalows, barns, etc. A great deal of information on the building trades—the very information the building public wants. The cream of 30 years' experience in the building field. Cloth.....\$2.00

**Construction of Dwelling Houses and Bungalows.** By U. V. Dustman. A book that shows you how to construct in fullest detail moderate priced homes. Every phase has been taken up, so that an ordinary mechanic can construct his own home. It also describes the different kinds of materials used in the construction of them and the latest methods of construction and estimating. 320 pages, 300 drawings and illustrations. Cloth.....\$1.00

**Modern American Homes.** By H. V. von Holst. A collection of plans, photographs and descriptions of over 100 one and two-story and larger homes, apartment houses, summer cottages, garages and miscellaneous buildings by the leading architects of the United States. Contains many ideas of great value to the prospective home builder. 108 plates of plans, interiors and exteriors. Cloth.....\$2.50

**Churches and Chapels.** By Frank E. Kidder. Revised and enlarged edition. Especially prepared for those who wish to study church requirements. For church committees, contractors and architects. The best American book on church design and construction. 120 illustrations in the text and 47 full page plates. Cloth.....\$3.00

**The Steel Square.** Two volumes. A practical treatise on the uses of the Steel Square, by Fred T. Hodgson, 600 pages, 500 illustrations. The author was the first—really the only—to write on this important tool, and the two volumes contain the easiest as well as the latest methods of using the Steel Square for the solution of the many problems in building construction. The two volumes are of the greatest value to the young carpenter. Single volume, Part I. Cloth.....\$1.00  
Part II.....1.00  
Two Volumes.....2.00

**The A. B. C. of the Steel Square and Its Practical Uses.** By Fred T. Hodgson. 130 pages, fully illustrated. Besides being a handy book on the simpler problems solvable by the steel square, it contains problems in Handrailing and Stair Building in connection with the Steel Square. Cloth.....\$0.50

**Modern Carpentry and Joinery.** Vol. I. By Fred T. Hodgson. 300 pages, 318 illustrations. Over one million copies have been sold. One of the best books for teaching the young workman the art of correct and easy woodworking. No bewildering formulas and algebraic puzzles. It can be understood by anyone who can read everyday English. Cloth.....\$1.00

**Modern Carpentry and Joining.** Vol. II. Similar to Vol. I, on advanced lines. Many of the more difficult problems of construction are solved fully and plainly. The author's method of explanation being adapted to the class of readers most apt to study the subjects. Cloth.....\$1.00

**Modern Estimator and Contractor's Guide.** For pricing all Builders' Work—with many tables, rules and useful Memoranda. By Fred T. Hodgson. 318 pages, 100 illustrations. A good and reliable work, giving a clear explanation of the several methods employed for estimating by comparison, cubic feet, quantities, detail, etc. Cloth..\$1.50

**Estimating.** By Edward Nichols. 140 pages, 35 illustrations. For all workers in building trades. Tells how to estimate intelligently. Price.....\$1.00

**Steel Square Pocket Book.** By Dwight L. Stoddard. Readily carried in a small pocket. This book contains the solution of many building problems by means of the Steel Square. The carpenter having it need never be stumped by problems on the job or in the shop. Second edition. Revised and enlarged. Cloth.....\$0.50

**Hicks' Builders' Guide.** Revised to date. By I. P. Hicks. A practical system of estimating material and labor, also the best methods of framing all kinds of roofs. Cloth.....\$1.00

**Heavy and Light Timber Framing Made Easy.** By Fred T. Hodgson. Over 300 pages. Fully illustrated. Framing in nearly all its branches treated in a plain, intelligent manner; handling and preparing timber, balloon framing, shoring, bracing, barns, bridges, towers, churches, factories, etc. Cloth.....\$2.00

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## A distinctive finish on any building is a good advertisement for the builder

The first impressions are the most lasting and effective.

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Good wood and good workmanship will be enhanced if the right finish is used. Using inferior finishes is poor economy when your reputation is at stake.

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represent the difference between mediocre and *good* for interior decorating. They are the identical products that have helped in making Stickley Furniture distinctive.

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**STICKLEY BROS. CO.**  
Grand Rapids - Michigan



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☞ You can turn out high class products on IDEAL equipment at low cost.

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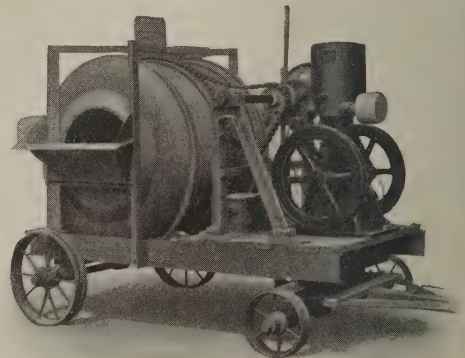
☞ We make hand equipments as well as complete power outfits for concrete, stone or brick.

☞ We also manufacture a complete line of Concrete Mixers.

☞ Send for literature.

## Ideal Concrete Machinery Co.

1312 Monmouth Ave., Cincinnati, Ohio



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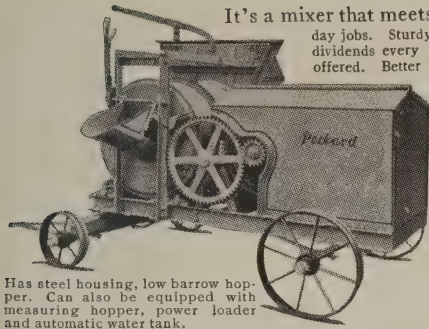
1915 Mixer Sensation

5 Ft. Cap.

On Steel Trucks-3 H.P. Engine

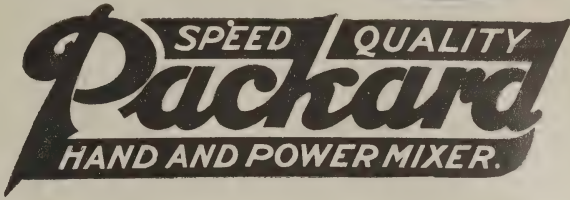
Steel Housing-Low Barrow Hopper

\$185



Has steel housing, low barrow hopper. Can also be equipped with measuring hopper, power loader and automatic water tank.

It's a mixer that meets every possible requirement on every-day jobs. Sturdy, but light in weight. An investment that will pay dividends every day it's used. Nothing like it for the price ever offered. Better than most of the mixers that cost one or two hundred dollars more. Read the specifications and description below.



**SOLD ON 5 DAYS' TRIAL--CASH OR TERMS**

Has steel trucks. Runs in wagon tracks. Substantial drum with mix and remixing action like the large \$2,000 paver. 3 horse power engine. Fast discharge. Has low barrow hopper. Steel housing over engine. Exceptionally good for county or township work, for silo builders and general contractors. Sold on 5 days' trial. Money back if it fails to come up to all claims. No quibbling or argument.

The biggest mixer value in the world. Get free catalog and full particulars about our trial proposition, low cash price and our reasonable easy payment offers.

If you want a hand mixer that can also be used on belt, a mixer that's cheap but good, ask about our Packard Hand Mixer. Address

**CONTRACTORS' MACHINERY COMPANY, 120 11th Street, Keokuk, Iowa**

Richmond, Va.....	66	130,638	88	281,399
Sacramento .....	125	127,304	83	225,540
Erie .....	62	125,139	95	193,564
Pasadena .....	161	118,216	144	123,389
Ft. Worth .....	31	104,840	23	159,400
Ft. Wayne.....	38	100,975	39	102,150
Elizabeth, N. J.....	40	98,388	45	111,438
Utica .....	39	95,500	64	143,825
Seranton .....	35	88,852	45	152,625
Lawrence .....	24	87,600	16	61,250
Sioux City.....	38	84,477	59	118,127
Youngstown .....	48	79,275	58	150,740
Trenton .....	78	79,239	70	101,650
Portland, Me.....	20	77,050	26	72,495
Wilkes Barre.....	126	76,493	22	212,428
Schenectady .....	47	75,155	..	373,920
New Orleans.....	..	69,632	..	139,716
Holyoke .....	15	65,200	17	191,780
Bayonne, N. J.....	17	57,175	16	29,618
San Jose .....	45	57,142	37	35,550
Evansville, Ind....	85	57,086	73	103,405
Davenport .....	39	56,475	19	58,200
Spokane .....	23	55,880	56	78,610
Springfield, Ill....	25	55,100	27	41,425
Tampa .....	132	54,361	123	104,660
Dayton .....	46	53,625	43	111,975
Savannah .....	32	51,600	71	120,235
Kansas City, Kan..	51	50,435	60	62,703
Paterson .....	68	46,961	61	81,030
Saginaw .....	36	39,550	19	17,251
Lincoln, Neb.....	25	39,475	32	145,623
Troy, N. Y.....	38	37,450	36	27,150
St. Joseph, Mo.....	49	36,410	49	132,515
Tepeka .....	22	35,105	34	40,308
Nashville .....	126	33,655	78	78,946
Chattanooga .....	145	28,258	182	38,610
Passaic .....	20	22,410	24	105,090
Altoona .....	31	20,935	46	65,952
Stockton, Calif....	26	20,510	26	32,450
Reading .....	24	20,350	34	58,650
Hoboken .....	17	20,075	19	24,679
South Bend, Ind....	13	16,275	11	29,525
Totals.....	15,642	\$36,186,915	17,814	\$50,008,632

There were increases in 19 cities and losses in 74 cities. People in the central west should find comfort in the fact that building operations in Chicago for November were little ahead of a year ago, the same number of permits having been taken out, involving \$6,513,150, an increase of \$22,150 over the same month a year ago. In keeping with this record is that of Cleveland, which had an increase of 73 per cent, Pittsburg 11, St. Paul 9, Peoria 228, Worcester, Mass., 41, Allentown, Pa., 298, Bridgeport, Conn., 52, New Haven 47, Tacoma 326, Syracuse 29, San Antonio 104, Akron, Ohio, 4, Lawrence, Mass., 43, Portland, Me., 6, Bayonne, N. J., 93, San Jose 60, Springfield, Ill., 33, Saginaw 129, Troy, N. Y., 38. On the other hand, New York shows a decrease of 45 per cent, Boston 45, Brooklyn 30, Philadelphia 39, Detroit 39, St. Louis 39, Milwaukee 59, Buffalo 14, Washington 35, Hartford 63, Rochester 39, Columbus 5, Newark 32, Kansas City 63, Cincinnati 28, Toledo 2, Cedar Rapids, Ia., 49, Seattle 41, Springfield, Mass., 79, Grand Rapids, Mich., 38, New Bedford, Mass., 43, Omaha 50, Elizabeth 12, Utica 34, Seranton 42, Sioux City 28,



# Diamond Expansion Bolts

For fastening all kinds of material  
to brick, stone or concrete—

**Quickly  
Securely  
Positively**



**"They Hold as Long  
as the Wall Lasts."**

**Diamond Expansion Bolt Co.**  
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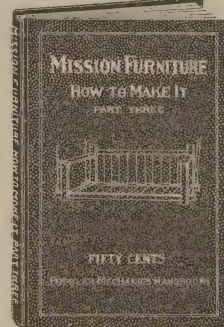
## A BOOK OF NEW MISSION FURNITURE DESIGNS

### Part 3—Mission Furniture HOW TO MAKE IT

A 128 page collection of 36 excellent new designs that have never before been published and that are entirely different from those in the books Parts One and Two previously issued.

**Handsome Cloth Binding  
Price 50c Postpaid**

This new number has just been published and those already in possession of Parts One and Two will find this an even greater value in variety and excellence of the plans.



### A feature of the New Book is a Complete Set of Dining-Room Furniture Designed to Harmonize Perfectly

If you are at all handy with tools, you will find that the plainly written directions, dimension drawings and half-tone illustrations will enable you to

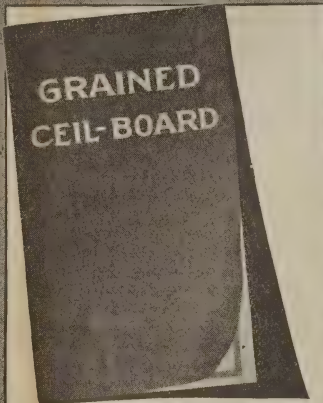
### Make Your Own Furniture and Save Two-Thirds

The many who use tools for pleasure will find this book a working guide which will furnish many moments of delightful and profitable occupation while several of our readers have been able to devote their entire time to this work by disposing of what they have made at a nice profit. One man made and sold \$400 worth of one piece alone.

Parts One and Two in this series are also 50 cents each postpaid

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**FREE  
BOOKLETS  
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## Carey Ceil Board The Scientific Wall Board

The booklets tell you of profitable business during the dull season. The sample will convince you that the booklets are most conservative in what they promise.

Ceil Board is furnished in Plain Gray, Plain Tan, Quartered Oak and Circassian Walnut finishes and offers unlimited possibilities for winter work for the carpenter.

Finish the unlined attics in your town—cover up the cracked plaster walls—put in beautiful wainscots of Ceil Board in hardwood finishes—make shirt waist boxes, clothes presses, etc., in Oak or Walnut finish.

A thousand uses for Ceil Board while outside work is at a stand still, and it costs no more than the ordinary wall board.

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## LOOKING FOR A CHANCE TO GROW?

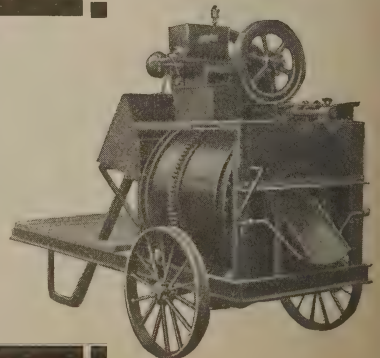
Are you itching to do bigger things—bigger work? Records show that nearly every big general contractor was a carpenter contractor or builder and that a concrete mixer started them on the way.

### The No. 1 ARCHER SPECIAL CONCRETE MIXER

Has helped many carpenters and builders to success in general contracting. Why? Because it is designed and built to operate most efficiently, consequently most economically on every job—large or small. Take note of these individual features of the Archer Special. It is end discharge, enabling you to spout concrete direct into forms in many places—foundations, sidewalks, roads, etc. It is easily portable. One man can lift the platform end and turn or shift the Archer. It is a  $\frac{1}{2}$  sack mixer and has a capacity of  $4\frac{1}{2}$  cubic feet of WET concrete per batch, or 50 yards per day.

We can't begin to tell you all of the money-making features of the Archer here, so let us send you our nicely illustrated catalogue. It tells all and is FREE for the asking.

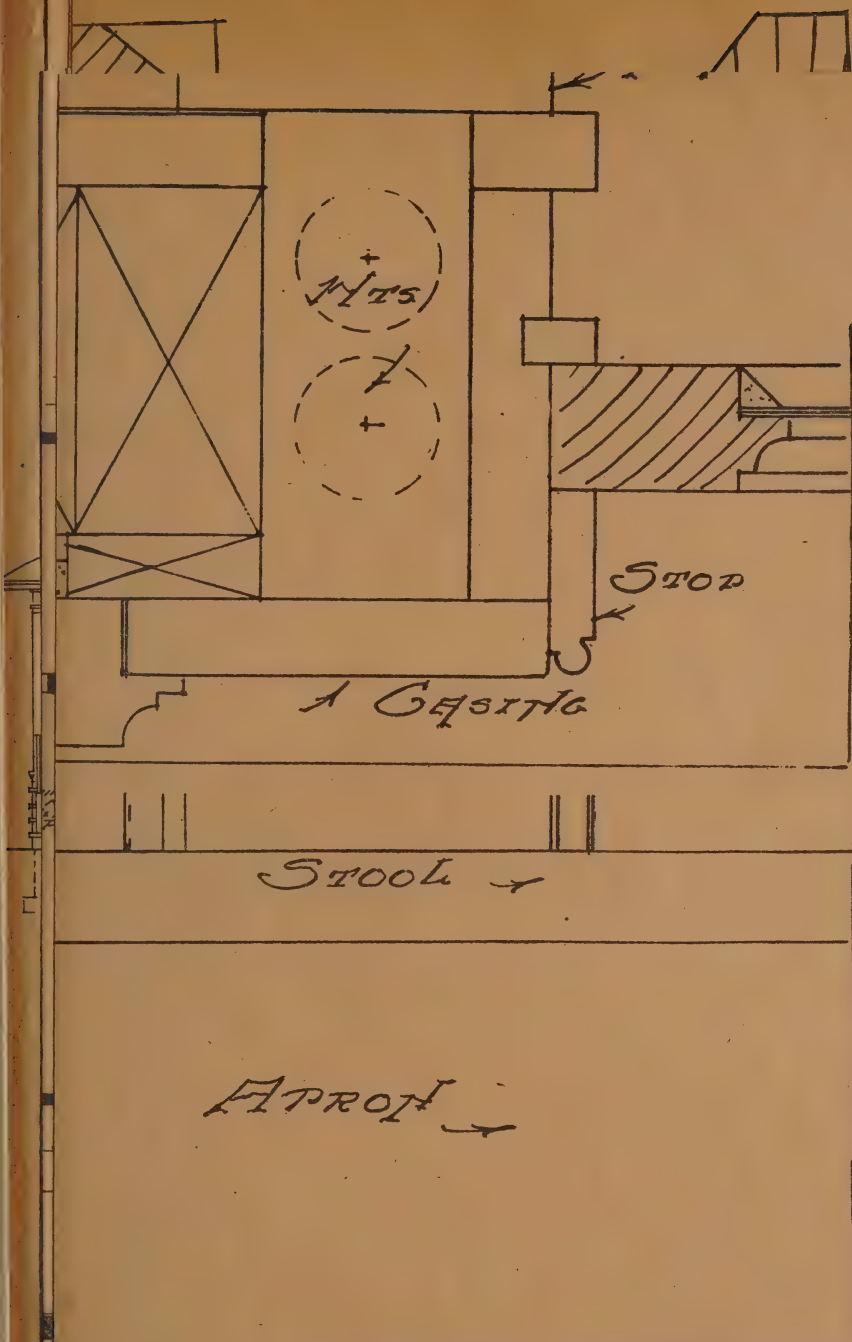
**Archer Iron Works, 2435 W. 34th Place, Chicago, Ill.**



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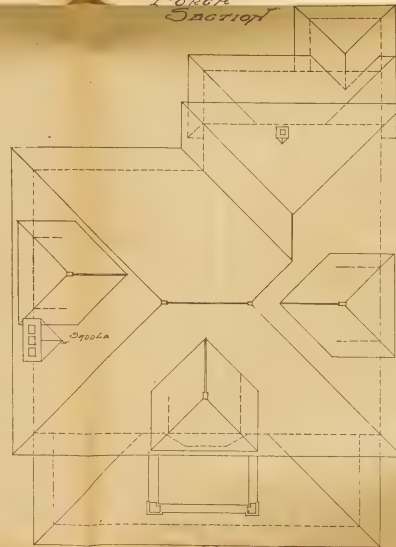
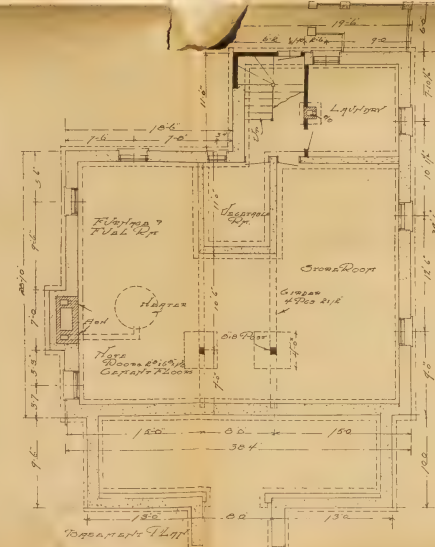
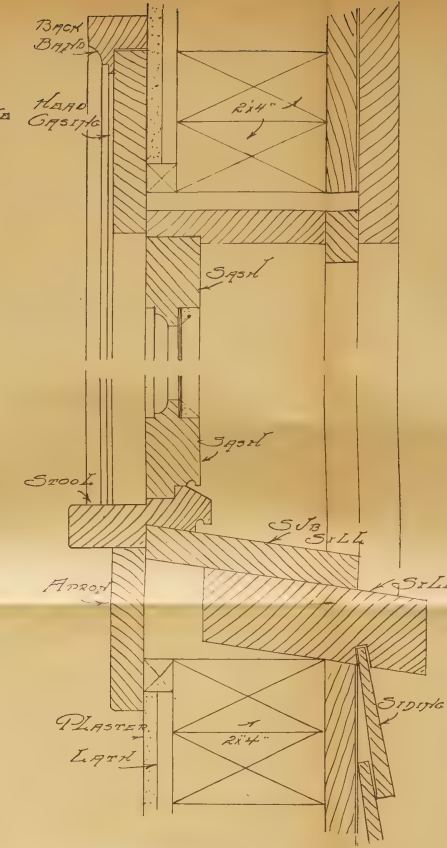
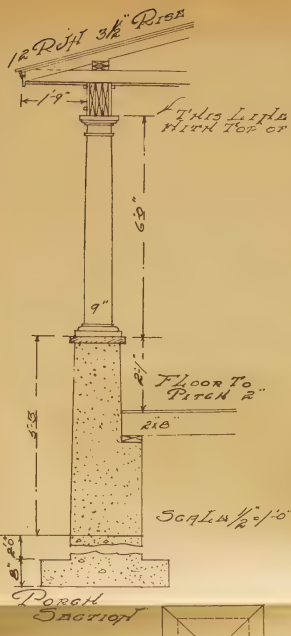
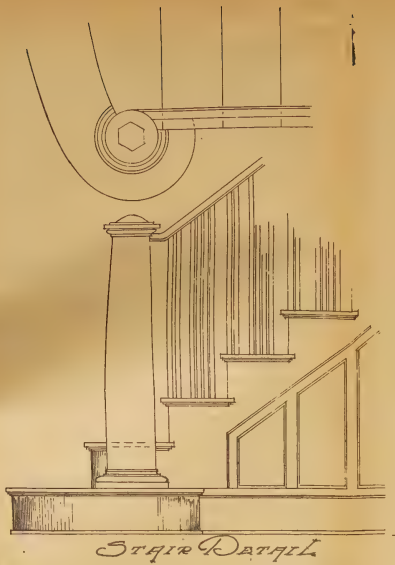
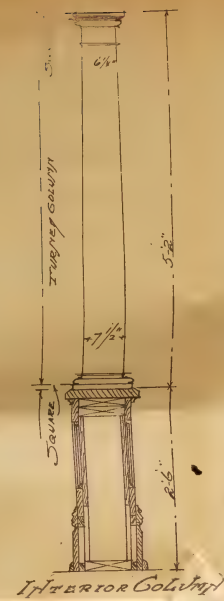


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BOX FRAME DETAIL





SECTION OF CASEMENT

SUPPLEMENT TO

# THE NATIONAL BUILDER

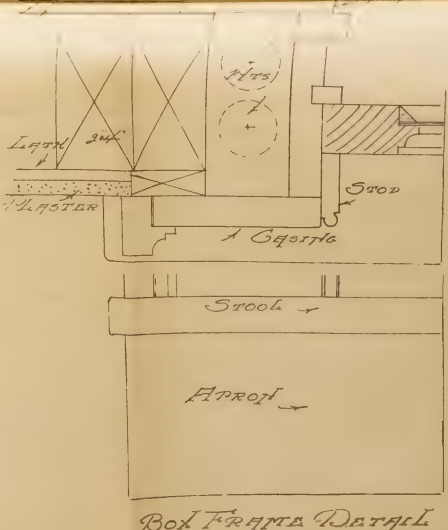
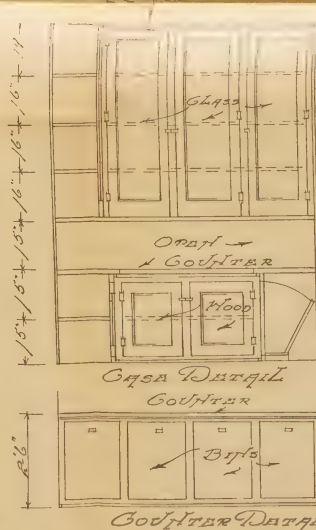
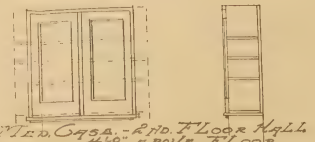
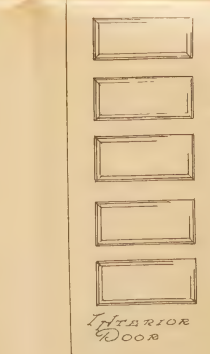
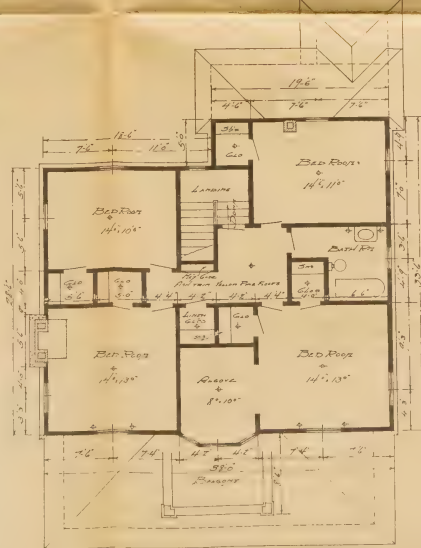
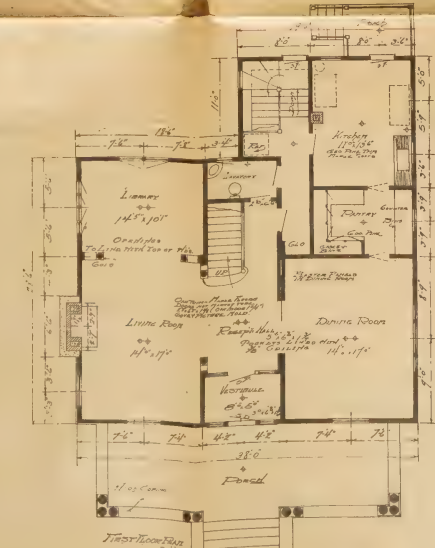
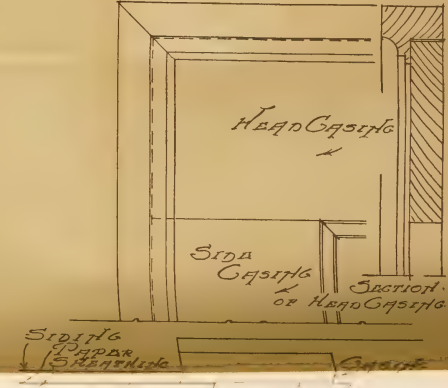
JANUARY, 1913

NATIONAL BUILDER DESIGN No. 390; A MICHIGAN RESIDENCE

Scale for plans and elevations, 1 inch equals 8 feet. Details 1/2 inch, 3/4 inch and 1 inch equals 1 foot, one-half size and full size.


FOR DESCRIPTION AND ESTIMATE SEE PAGE 35

This House is Shown in Colors on Front Cover





# THE NATIONAL BUILDER



FEBRUARY  
1915

PRICE 15 CENTS

A Concrete Residence • • E.E. Roberts Architect.  
For complete plans of this house see supplement  
with this number.

Estimate and description on page 35.



# The Little Builder

## Concrete & Mortar Mixer.....

**"BALL BEARING"**

No job is too small to handle at a profit and very few too large for the *LITTLE BUILDER*. It is a mixer you can hardly afford to be without. Jobs which you have previously sub-let or mixed by hand can now be done with your own men much quicker, with no delays, and the profits go into your own pocket that heretofore went to others. Use it for your floors, steps, foundations, drives, form work—anything in the concrete line. *It is also a good mortar mixer.*

The ease with which it can be handled and moved around from job to job makes it most convenient for building operations, and the low price places it within every builder's means. It should be a part of your building outfit. It costs only a few cents a day to operate, and saves two to four men. It will pay for itself in a week's time.

**\$165.<sup>00</sup>**

Complete as Illustrated

**\$265.<sup>00</sup>**

With Power Loader

**\$30.<sup>00</sup>**

For Hoisting Attachment



## Lansing Concrete Mixers

### The Little Builder

is an easy mixer to operate because the shoveling height is just right. Men are less tired at the end of the day than in two hours hand mixing. Power loaders if desired. The mixer is loaded on one side and discharged on the other and the gravel is never in the way of the wheelbarrows. The mixing is always in sight, which means a uniform, quick mix. It is easy to clean and gives a good mix. A high class, powerful 2 to 2½ H. P. engine is furnished—the best finished engine of the size ever built—strong, sturdy and plenty of power.

It is strong and durable, made of iron and steel throughout with few parts to wear out. Being ball bearing it requires little power and can be oper-

ated with one or more men. High wheels for easy hauling; ball and socket for rough roads and short turns; 4-inch steel channel frame; steel wheels; steel axles, etc.

Can be furnished with hoisting attachment for raising lumber, lath, brick, etc. The engine can be taken off quickly and used for other purposes if desired.

*Send for the circular today*

### Write for Concrete Machinery Catalog

We also manufacture larger power mixers, hand mixers, block machines, brick machines, cap and sill moulds, wheelbarrows, mortar trays, hods—everything in the builders line. Write for catalog.

*Specify just what you are interested in*

**LANSING CO., 1001 Cedar St., Lansing, Mich.**

Branch Houses and Stocks at: New York Boston Chicago Philadelphia Minneapolis Kansas City San Francisco

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# THE NATIONAL BUILDER

Vol. 57 (51st Year) Chicago, February, 1915

No. 2



Residence of W. H. Gardner, Oak Park, Ill., when the plasterer had finished the stucco exterior. See the Front Cover for our Artist's Idea of the Finished Building.

## NATIONAL BUILDER DESIGN No. 391

E. E. Roberts, Architect, Chicago, Ill.

For Floor Plans, Sections, Details and Full Working Drawings, see Supplement of this month. Estimated Cost \$9,550.71

## Estimate of a Concrete Home

*I. P. Hicks*

### EXCAVATING AND MASONRY

Excavating, 450 yards, 35c.....	\$ 157.50
532 cu. ft. concrete footing, 25c.	133.00
3,200 cu. ft. concrete in basement walls, piers and chimneys, 25c .....	800.00
3,480 cu. ft. concrete in main walls above the basement, 25c....	870.00
18 lineal feet brick part of chimney, \$2.25.....	40.50
240 yards cement plaster, gables, cornice, etc., \$1.25.....	300.00
375 yards cement plaster on concrete, 90c.....	337.50
2 cement chimney caps, \$3...	6.00
1,410 sq. ft. cement floor, \$10...	141.00
168 sq. ft. brick floor, 12c.....	20.16

5 cement steps, 42, lineal ft., 50c .....	21.00
---	-------

Total excavating and masonry. \$2,826.66

### LUMBER BILL

	Feet
56 2x12x16 ft. first floor joists.....	1,792
25 2x12x14 ft. first floor joists....	700
5 2x12x12 ft. first floor joists.....	120
56 2x12x16 ft. second floor joists..	1,792
25 2x12x14 ft. second floor joists..	700
5 2x12x12 ft. second floor joists..	120
56 2x10x16 ft. attic floor joists....	1,512
25 2x10x14 ft. attic floor joists....	575
10 2x10x12 ft. sleeping porch joists	200
50 2x 4x12 ft. attic ceiling joists..	400
36 2x10x12 ft. porch joists.....	720
40 2x 8x12 ft. porch ceiling and roof .....	640

\* Materials are figured at Omaha prices. Carpenter labor figured at 50 cents per hour.





Concrete gives a dignified exterior to the home.

12 2x 6x12 ft. rip diagonal for pitch to porch roof....	144	3,500 ft. 1x6 No. 2 sheathing, slate roofs, \$26.....	91.00
10 2x 4x12 ft. small porch ceiling and rafters .....	80	800 ft. 1x8 No. 2 lap, porch roofs and decks, \$26.....	20.80
30 2x 4x12 ft. for gables.....	240	496 ft. 1x4x12 ft. flg. porches, \$45 .....	22.32
60 2x 4x14 ft. for dormers.....	540	496 ft. 5/8x4x12 ft. ceiling, porches, \$30.....	14.88
12 2x10x16 ft. wall plates.....	324	1,230 ft. 5/8x4x12 to 16 ft. ceiling, \$30 .....	36.90
32 2x 6x18 ft. first story partitions	576	10 rolls building paper, 75c.	7.50
36 2x 4x18 ft. first story partitions	432	4 1 1/8x10x24 ft. cypress finish, \$50 .....	5.00
27 2x 6x18 ft. second story partitions .....	486	5 1 1/8x10x16 ft. cypress finish, \$50 .....	3.40
72 2x 4x18 ft. second story partitions .....	864	10 1x8x16 ft. cypress finish cornice, \$45 .....	4.73
60 2x 4x16 ft. attic partitions.....	660	10 1x8x14 ft. cypress finish cornice, \$45 .....	4.27
24 2x 4x16 ft. plates .....	264	20 1x6x16 ft. cypress finish cornice, \$45 .....	7.20
14 2x 4x12 ft. plates .....	112	20 1x6x14 ft. cypress finish cornice, \$45 .....	6.30
84 2x 4x24 ft. main rafters.....	1,344	10 1x4x12 ft. cypress finish cornice, \$45 .....	1.80
14 2x 6x16 ft. basement partition.	224	4 2x10x12 ft. cypress finish flower boxes, \$50 .....	4.00
50 2x 4x16 ft. basement partition.	550	2 2x12x10 ft. cypress finish flower boxes, \$50 .....	2.00
8 2x10x12 ft. inside cellar steps...	160	2 1x12x12 ft. cypress finish flower boxes, \$45 .....	1.08
45 1x 4x12 ft. bridging.....	180	3 1 1/8x12x12 ft. cypress finish rear steps, \$50.....	2.25
40 1x 6x12 ft. braces and backing.	240	6 1 x12x12 ft. cypress finish belt across gables, \$45.	3.24
Total feet framing lumber.....		16,691	
16,691 ft framing lumber, \$27...\$	450.65		
3,170 ft. No. 2, 8 inch lap, rough floors, \$26 .....	82.42		
1,480 ft. 7/8x2 1/4 face plain red oak flg., \$62.....	91.76		
400 ft. 7/8x2 1/4 face maple flg., \$53 .....	21.20		
1,700 ft. 7/8x2 1/4 face No. 1 flg., \$42 .....	71.40		
1,600 ft. 7/8x3 1/4 face star flg., attic, \$32 .....	51.20		

3 1 1/8x12x12 ft. cypress finish top porch rail, \$50....	2.25	3 inside cellar dr. frames, 2-6x6-6, \$2.00 .....	6.00
4 1 1/8x10x16 ft. cypress finish top porch rail, \$50....	4.00	1 inside cellar dr. frame, 2-10x6-6 .....	2.00
8 1 x 4x16 ft. cypress finish top porch rail, \$45....	2.20	3 doors, 2-8x6-6x1 3/8, \$2.50....	7.50
6 1 x 4x12 ft. cypress finish top porch rail, \$45....	1.08	3 doors, 2-6x6-6x1 3/8, \$2.50....	7.50
8 1x12x12 ft. Y. P. finish for closed shelves, \$45.....	4.32	1 door, 2-10x6-6x1 3/4, \$2.50....	4.00
Total lumber bill.....	\$1,020.15	1 outside grade door frame, 3-0x7-0, rab., 1 3/4 .....	2.25
MILL WORK		1 outside dr. frame, 2-6x7-0, rab., 1 3/4 .....	2.25
2 porch columns, 8x8x5 ft., \$2.25.\$	4.50	1 front dr. frame, 3-4x7-0, rab., 1 3/4 with side lights.....	8.00
2 porch newels, 8x8x3 ft. 10 in., \$2 .....	4.00	1 double door frame, 4-0x6-8, rab., 1 3/8 .....	3.00
480 ft. 1 1/8x2 inch square bed mold, 1 1/2c .....	7.20	2 twin window frames, 24x48, 1 lt., \$4.50 .....	9.00
420 ft. 3 1/4 inch crown mold, 1 1/2c..	6.30	2 twin window frames, 18x48, 1 lt., \$4 .....	8.00
200 ft. 7/8 cove mold, 1/2c .....	1.00	3 twin window frames, 18x32, 1 lt. dormers, \$4.....	12.00
2 cellar window frames, 34x16, 1 lt., \$1.50 .....	3.00	2 mullion screen porch frames, 22x58, 4 screens, \$8.....	16.00
2 cellar window frames, 28x16, 1 lt., \$1.50 .....	3.00	2 triple frames, 24x58, \$6.50...	13.00
2 cellar window frames, 16x16, 2 lt., \$1.50 .....	3.00	2 triple frames, 20x46 dormers, \$6 .....	12.00
1 triple frame, 30x16, 1 lt.....	4.50	1 triple frame, 22x62.....	6.50
2 cellar sash, 34x16, 1 lt., 50c...	1.00	1 frame, 22x22, 2 lt.....	2.00
2 cellar sash, 28x16, 1 lt., 50c...	1.00	1 frame, 24x28, 1 lt.....	2.20
2 cellar sash, 16x16, 2 lt., 50c...	1.00	2 frames, 16x58, 2 sash, \$2.20...	4.40
3 cellar sash, 30x16, 1 lt., 40c...	1.20	2 frames, 32x20, \$2.25.....	4.50
3 inside cellar dr. frames, 2-8x6-6, \$2.00 .....	6.00	1 frame, 14x32, 2 sash.....	2.00
		4 twin frames, 16x36, gables, \$4.	16.00
		4 twin frames, 20x48, \$4.50....	18.00



A home which fits into the surroundings.



1 twin frame, 16x28.....	4.00	1 door, 3-0x7-0 1 $\frac{3}{4}$ , pine, glazed	
1 frame, 22x16, 2 lt.....	2.00	D. S. ....	5.00
2 screen twin porch frames, 22x		2 doors, 2-0x6-8x1 $\frac{3}{4}$ , pine, glazed	
58, \$4 .....	8.00	plate, \$5.00 .....	10.00
1 frame, 28x20, 2 lt.....	2.00	2 doors, 2-6x7-0x1 $\frac{3}{8}$ , oak, \$5.00..	10.00
1 triple sash frame, 32x20.....	4.50	2 doors, 2-2x7-0x1 $\frac{3}{8}$ , oak, \$4.50..	9.00
1 double door frame with side		2 doors, 2-6x7-0x1 $\frac{3}{8}$ , pine, \$3.00..	6.00
windows .....	12.00	1 door, 2-8x7-0x1 $\frac{3}{8}$ , pine .....	3.00
4 sash, 24x48, 1 lt., \$3.60.....	14.40	15 doors, 2-6x6-8x1 $\frac{3}{8}$ , pine, \$2.80	42.00
4 sash, 18x48, 1 lt., \$3.00.....	12.00	7 doors, 2-4x6-8x1 $\frac{3}{8}$ , pine, \$2.60..	18.20
6 sash, 18x32, 1 lt., \$1.80.....	10.80	1 door, 2-8x6-8x1 $\frac{3}{8}$ , pine.....	2.80
6 sash, 24x58, 1 lt., \$4.40.....	26.40	40 plinth blocks, oak, 8c.....	3.20
6 sash, 20x46, 1 lt., \$3.00.....	18.00	280 ft. casing for doors, 7 ft., oak,	
3 sash, 22x62, 1 lt., \$4.50.....	13.50	3c .....	8.40
1 window, 22x22, 2 lt, \$2.....	2.00	160 ft. casing for windows, 10 ft.,	
1 sash, 24x28, 1 lt., \$1.75.....	1.75	oak, 3c .....	4.80
4 sash, 16x58, 1 lt., \$4.00.....	16.00	144 ft. head casing, oak, 3c.....	4.32
2 sash, 32x20, 1 lt., \$1.90.....	3.80	144 ft. cap mold, oak, 3c.....	4.32
2 sash, 14x32, 1 lt., \$1.50.....	3.00	72 ft. window stool, oak, 3c.....	2.16
8 sash, 16x36, 1 lt., \$1.80.....	14.40	72 ft. apron, oak, 3c.....	2.16
8 sash, 20x48, 1 lt., \$3.00.....	24.00	144 ft. door stops, 7 ft. 2 in., oak,	
2 sash, 16x28, 1 lt., \$1.50.....	3.00	1 $\frac{1}{2}$ c .....	2.16
1 window, 22x16, 2 lt., \$1.70...	1.70	224 ft. window stops, 14 ft., oak, 1c	2.24
1 window, 28x20, 2 lt., \$2.20...	2.20	210 ft. base, oak, 4c.....	8.40
3 sash, 32x20, 1 lt., \$1.90.....	5.70	210 ft. floor mold, oak, 1c.....	2.10
2 side windows to door, 2' 8"x		240 ft. picture mold, oak, 1 $\frac{1}{2}$ c....	3.60
7' 0", \$4.....	8.00	168 ft. beam ceiling, oak, 12c.....	20.10
2 side windows to door, 1' 4"x		64 ft. plate rail, oak, 10c.....	6.40
7' 0", \$3 .....	6.00	84 plinth blocks, pine, 5c.....	4.20
4 blinds, 24x48, \$1.75.....	7.00	514 ft. door casing, pine, 12 ft., 2c.	10.28
4 blinds, 18x48, \$1.50.....	6.00	480 ft. window casing, pine, 10 ft.,	
8 blinds, 16x36, \$1.40.....	11.20	2c .....	9.60
8 blinds, 20x48, \$1.60.....	12.80	360 ft. head casing, pine, 2c.....	7.20
2 blinds, 16x28, \$1.30.....	2.60	360 ft. cap mold, pine, 2c.....	7.20
2 sets dr. jambs, 2-6x7-0, oak, 90c	1.80	192 ft. window stool, pine, 2c....	3.84
2 sets dr. jambs, 2-6x7-0, pine,		192 ft. apron, pine, 2c.....	3.84
70c .....	1.40	378 ft. door stop, pine, 14 ft., 1c..	3.78
1 set dr. jambs, 2-8x7-0, pine....	.70	672 ft. window stop, pine, 14 ft.,	
1 set dr. jambs, 2-6x6-8, pine....	.65	3 $\frac{1}{4}$ c .....	5.04
2 sets dr. jambs, 2-2x7-0, oak, 85c	1.70	324 ft. pine picture mold, 1 $\frac{1}{4}$ c....	4.05
2 sets jambs, cased openings,		440 ft. pine base, 3c.....	13.20
oak, \$1.20 .....	2.40	440 ft. floor mold, 1 $\frac{1}{2}$ c.....	2.20
10 sets jambs, 2-6x6-8, pine, 65c.	6.50	Front stairs .....	50.00
5 sets jambs, 2-4x6-8, pine, 60c.	3.00	Attic stairs .....	18.00
2 sets jambs, 2-4x6-8, pine, attic,		2 medicine cabinets, \$10.....	20.00
60c .....	1.20	1 linen closet .....	10.00
4 sets jambs, 2-6x6-8, pine, attic,		1 kitchen case .....	15.00
65c .....	2.60	2 pantry cases, \$22.50.....	45.00
1 set jambs, 2-8x6-8, pine, attic.	.70		
1 front door, 3-4x7-0x1 $\frac{3}{4}$ , oak,		Total mill work.....	\$965.55
glazed plate .....	18.00		
2 doors, 2-8x7-0x1 $\frac{3}{4}$ , oak, glazed		CARPENTER LABOR	
plate, \$16 .....	32.00	16,691 ft. framing lumber, \$10...\$166.91	
1 door, 2-8x7-0x1 $\frac{3}{4}$ , pine, glazed		7,470 ft. sheathing, \$10.....	74.70
plate .....	6.50	2,222 ceiling and porch floors, \$15	33.33
		240 lineal ft. main cornice, 10c..	24.00
		150 lineal ft. dormer cornice, 8c.	12.00

140 lineal ft. porch cornice, 12c.	16.80	Carpenter labor .....	903.34
Rear porch steps.....	5.00	Canvas roofs .....	65.00
3,580 ft. 2 1/4 face finish floor, \$2.	71.60	Slate roof, 35 sq. @ \$13.00.....	455.00
1,600 ft. 3 1/4 face finish floor,		Structural iron .....	70.00
\$1.50 .....	24.00	Hardware and nails.....	130.00
27 squares smoothing and		Tin roofs and tin work.....	80.00
scraping, \$1.50.....	40.50	Tile bath room floors.....	60.00
45 per cent cost of mill work		Plastering, 1,700 yards, 27c.....	459.00
for finishing .....	434.50	Electric wiring .....	65.00
		Plumbing and gas fitting.....	780.00
Total carpenter labor.....	\$903.34	Painting .....	260.00
The complete estimate:		Heating plant .....	420.00
Excavating and masonry.....	\$2,826.66	Mantels .....	150.00
Lumber bill .....	1,020.15	Incidentals, 5 per cent.....	443.60
Mill work .....	965.55		
		Total estimate .....	\$9,550.71

# How To Use This Estimate

This estimate is figured at Omaha prices, with carpenter labor at 50 cents an hour. To use this estimate for other localities the reader will note that the price of each grade of lumber, as well as all other materials, is given in the regular trade units, that is per thousand feet for lumber, per thousand for shingles, per cubic yard for excavating, etc.

It is a simple matter to substitute the prices current in your vicinity for the

prices given in this estimate and to extend the quantities and so determine the exact cost for your neighborhood.

For instance, framing lumber may be \$30 per thousand in your town while it is figured in this estimate at \$27. Simply extend the number of feet at \$30; labor may be more or less. The owner may want to contract for the furnace or plumbing separately. The detailed estimate makes these changes possible.



A house should appear at ease. See how inviting this one is.



# Concrete for the Home

**F**EW of the materials of construction have a longer history than concrete.

Numbered among the lost arts for many centuries it has once more become a prominent building material, and its basic material, Portland Cement, is today the one material universally used in masonry construction. Whether the foundations, walls, piers, floors, etc., are of stone, brick, tile, terra cotta or concrete, the use of cement as the building material is evident.

## WHY CEMENT IS INVALUABLE

Lime mortar can be made strong enough to be used in any ordinary dwelling house, or even in much higher buildings. It may even be cheaper than cement mortar. It loses its value, however, from the fact that it contracts slightly under pressure and requires some time to become settled. Cement mortar on the other hand, reaches its final shape and consistency in a few hours, and no additional load has any effect on it. This saving in *time* and certainty of measurements, makes Portland Cement masonry and concrete the pre-eminent material for construction.

## ABUSE OF CONCRETE

Concrete, while it has been widely used, has also been widely *abused*. Carelessness in design, and recklessness in mixing, construction and erection has led to deplorable accidents. Somewhat similar catastrophes occur with brick, stone and frame buildings also, but concrete has a way of failing early or not at all. After the mixture really becomes *concrete*, and the mechanical and chemical unions are complete, concrete is made and made to stay. When once the raw materials are combined, practically all danger of failure is past and the concrete gains in strength from day to day and from year to year. Careful design by the architect or engineer, careful mixing and placing by the contractor will be sure to give good results.

Concrete has been used many times where it should not have been. So has stone, brick and wood. It has been poorly mixed, skimped in cement, and carelessly placed. The same is true of every other material. Poor concrete will declare itself quicker

than any other form of construction and therein often lies its safety.

## OUR HOMES

The greatest concern has always been felt for our homes. They must be right and as near perfection as our ideas can conceive and our finances permit. As soon as mankind realizes that any given construction is faulty, it is discharged, and the better one substituted for it. The standard has thus been raised from the caves of the Stone Age to the present residences in which every consideration is given to health, comfort and convenience, with provisions for heat, light, ventilation and sanitation.

Many different materials have been used for home building. Stone, Brick, Adobe, Frame, Esquimos use ice igloos, the Indians skin tents. Each uses the best he knows anything about and each moves up a grade as soon as the improved materials come within his knowledge and price.

In condemning the use of any material for any purpose we can only do so from the standpoint of superior wisdom provided the user is financially able to use the best.

What should be used as a basic material for our homes? We are all subject to about the same conditions. We require three meals a day and eight hours sleep. We must provide heat and light, ventilation and sanitation. So far all homes are alike. The size of families, their social duties, etc., influence the problem somewhat, but in the main there is little else to be considered.

In presenting this house, on our cover as well as on the preceding pages, there is no excuse for our describing it in detail. It is made to live in, and while not completed when the views were taken, it will soon be, and will not only improve its own grounds, but will be a well-defined feature of its neighborhood, and a real home for the owner.

## WHAT THE BUILDER SEES

The prominent feature, from a builder's view, is that the house is of monolithic concrete, the walls being double with an airspace for insulation against heat, cold and dampness. The outside walls, being prac-

tically in one piece the whole way round as well as from top to bottom, are therefore proof against cracks due to settlement or other causes, while the stucco surface provides the appearance which is demanded even in cheaper houses.

Stucco provides a finished surface, which may be as varied as the owner, architect or builder may desire. It may be smooth as glass, or of any desired roughness. Nor need the surface follow exactly the lines of the supporting wall. Additional panels, mouldings, friezes or other ornamentation may be easily added, the mason or plasterer who applies the stucco being more often than not an artist in his line. One solid color may be used, or as many as desired. The colors may be on the surface only, as with paints or surface washes, or they may be a part of the body itself. Stucco may well be the medium to carry the waterproofing materials, and when this is properly incorporated, neither heat, cold, wind or dampness can reach the inner wall.

Ventilation consists in introducing fresh air at specified places, and taking out the vitiated air at others. Too often there are a number of places supplying air without the consent of the occupants, while the vitiated air gets out as best it may. One of the few good points about old houses is the fact that the air is generally good when the wind blows, for it blows right through. Advanced construction provides weather-strips and caulked joints around all openings, so air is brought in only where intended, and so can be better regulated.

A careful study of the supplement for this month will give the reader a clear insight into the intricacies of modern home

planning and building. The owner is interested chiefly in the plan, trusting the architect to provide the walls, floors and other constructive features which will allow the full use of the rooms for comfort. The owner is concerned in a lesser degree with the appearance, although this section cannot be slighted for *satisfaction* to the owner.

The financial question disappears when the house is completed. It may have entered into the conditions, but for all practical purposes is at best a minor consideration. The owner wants a home in which he can find comforts and conveniences, protection against the weather, and a place where he and his family can receive and entertain their friends. The architect, being a specialist in design and construction, provides the arrangement of rooms, the exterior and interior appearances. He must realize the final appearance of the entire project before the ground is broken.

The contractor has an easy time of it. His chief duty is to consider the cost, and upon his ability to estimate it correctly depends his continuation in business. The better the plans, the easier for the builder and the surer the satisfaction of the owner.

Why should not more concrete houses be built? They provide safety and comfort for the owner. They improve the appearance of the street. From concrete foundations to slate roof, there is no deception as to material or construction. From the contractor's standpoint, they possess no difficulties of construction, and as they will outlast the owner, the architect or the contractor, will be a permanent monument to the owner's wisdom, the architect's study, and the contractor's skill.

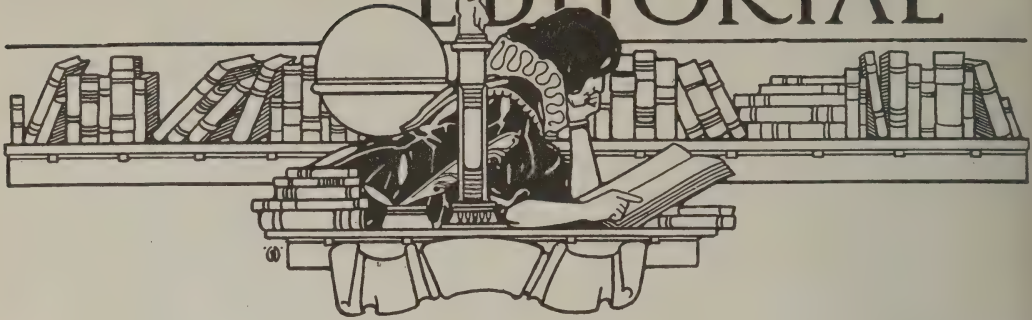


Concrete is a material for the garage as well as the house.





# EDITORIAL



What about those 1915 Resolutions? Are you living up to them? If not, why?

\* \* \*

Perhaps they were not worth living up to. Like many others they were made off-hand. Always make good resolutions, and when made, stay by them.

\* \* \*

We have probably not said as much of our large detail sheets as we ought to have done, for they are one of the main features of this publication and in value, are really worth three or four times the subscription price, and are much better for general use than blue prints, and have the advantage of being up-to-date, as well as novel and correct. The Sheet for December shows the plans and complete structural drawings of a modern improved Barn, including foundation and roof. Men in the country or in towns, who build Barns, should certainly have a copy of this sheet, and the estimate along with it. All these detail sheets have a value of their own, and we believe we are the only publishers in the United States, that regularly publish sheets of this kind, and this has been our habit for upwards of fifty years. We feel certain, that to the regular issuing of these sheets, the great popularity of *THE NATIONAL BUILDER*, to a large extent, is due among country builders, contractors and carpenters generally.

\* \* \*

We would suggest that these Detail sheets be carefully smoothed out when received, and that a roller of soft pine or other wood, be made long enough to suit the largest sheet and that they—the sheets—be glued, or pasted, at the right hand edge, and nicely attached to the roller. When dry and ready for use, they can be unrolled like a map, laid on a table or bench, or even on

the floor, where they can be read with ease. They may be rolled up again and stood in the corner or placed on shelves until required for further use. This plan tends to preserve the sheets, keeps them clean, and they may be indexed and numbered by pasting a slip of paper on the top left-hand corner, with the months, date, number, and subject written on them. The slip of paper should project over the edge about an inch, and the writing should be plain, or hand-printed, so that it can be easily read, and thus save time in discovering the sheet required. Any reasonable number of sheets may be attached to the pole, but they must not be pasted one over another, when it can be avoided. These sheets are valuable and their usefulness can not be measured.

\* \* \*

The Pros and Cons regarding the employment of quantity surveyors is being generously discussed in the Architectural and Building papers throughout the country, and the trend of argument seems to run in favor of adopting some system where the services of a quantity surveyor will be a part of the scheme in obtaining correct estimates of the cost of any proposed building. Of course, this would mean a slightly visible increase in the cost, as a special sum for the services of the surveyor would appear as a separate item on the bill, but in reality the cost of the whole would be less, as the contractor would have little use for extras, contingencies, and "left-outs." The client would know exactly where he stood, from beginning to end. The shadows of "Extras," would not, like the sword of Damocles "hang perpetually dangling over his head."

\* \* \*

Building operations in Chicago continue

to show a fairly good record, as compared to the corresponding period last year. While the number of permits were the same in both periods, the cost of building last month was slightly higher than in November last year. According to figures compiled from reports from ninety-three cities throughout the country, permits were issued for 15,042 buildings, involving an aggregate cost of \$36,186,915, last month, as compared to 17,814 buildings and a cost of \$50,008,632 during the same month last year. This shows a general decrease of 27 per cent. In Chicago permits were taken out during the month of November for 840 buildings, involving a total estimated cost of \$6,513,150, as compared to 840 buildings, and an aggregate cost of \$6,491,000 last year, an increase of \$22,150 last month.

\* \* \*

This is rather an early date to expect a boom in building trades for 1915, yet at this writing, it does seem as though business was brightening up quite briskly, and there are not nearly so many men out of work today as there were a month ago, and some of our correspondents writing from the South and West, tell us the outlook never appeared better.

\* \* \*

For a man who will work, who is able and capable, and who will go forth and honestly look for it, there is work, for we know as a fact there is an abundance of work of all sorts needing to be done in every part of this big country. The work may not be the kind desired, but then we rarely get in this world the things or occupations we wish, and one is often compelled to take such substitutes as are convenient or presented to us; and which should be accepted in the best form possible. We cannot always have our choice in such matters, and perhaps it is just as well.

\* \* \*

By some devious method of reasoning our English cousins of the long ago conceived a "hundredweight" to contain 112 pounds, and that twenty of such hundredweights should be called a ton. Many could see neither rhyme nor reason in dubbing 112 pounds a "hundredweight," cut off the 12 extra pounds, considered a hundredweight to be 100 pounds, and a ton to be

2,000 pounds. The result of this conflict of opinion has been the establishing in England—and to a certain extent in this country—of two different hundredweights and two different tons. Britons change their customs slowly, but it seems to have been borne upon them of late, that a certain degree of absurdity is inseparable from dual tons and hundredweights. In proof of this supposition, the Textile Institution of Great Britain has taken steps to urge upon the railroads the adoption of the cental (100 pounds) and 1,000 pounds (ten centals) as major standards instead of the hundredweight of 112 pounds and the ton of 2,240 pounds as the basis of their rates. This is another strong indication that the systematic campaign of the Decimal Association is bearing fruit. Should the railroads of Great Britain yield to the prayer of the Textile Institution in this particular, it would mean a long stride towards the full adoption of the international Metric system by the people of that country.

\* \* \*

In a recent article in the "Times Engineering Supplement" there is a good description of the construction, and working of derrick cranes. The writer touches on the question of safety, and makes a statement which will be somewhat disquieting to any Glasgow citizens who may chance to read it. "In the city of Glasgow," he says, "where derricks and cranes on high trestles have long been used in the erection of buildings, such accidents as have happened have not been attended with serious loss of life, and public attention has not been drawn to the danger. It is not surprising, therefore, to find that the city by-laws regulating the use of such derricks are by no means stringent, and that there is practically no check on the contractor who is careless or reckless enough to use a crane that for any reason is unfit for its work. In London, where by reason of loftier structures, greater congestion of buildings, and more crowded streets, the risk of life and property through a crane accident are so much greater, the utmost vigilance is necessary." Whether the utmost vigilance is given the writer does not say, but the implication seems to be that London is better protected than Glasgow in this manner.



# Church Spires and Their Repairs

*Jno. Y. Dunlop*

THE church spire of today, which is constructed wholly of stone is one of those features for which we must look back to the early Romanesque church for our first examples. At that time those early square towers were mostly surmounted by pyramidal roofs of low pitch. None probably now remain but we have some examples of large square towers which show what the shape must have been.

The present typical spire was no doubt developed early in the Gothic period. It was octagonal in plan and the four sides which coincided with the face of the tower rose directly from the walls above a slightly marked eaves course. The four oblique sides were connected to the tower by a feature called a broach, which may be described as the interpenetration of a square and a more lofty octagonal pyramid.

This type of broached tower is to be met with all over the country and its chief ornament consisted of small windows called spire lights, each mounted by its gable. At a later time in this style, it was common to finish the tower by a parapet and to start the spire inside this boundary, sometimes with broaches but most often without them. Pinnacles were added at the corners and the surface of the spire was often enriched with bands of ornament. Spire lights occur as before and the general proportions were of a most slender nature and the moulded ribs which generally ran up each angle were often decorated with crockets arranged in a formal shape.

Towers were after this built square in shape with projecting buttresses from which immediately above the parapet the corners of the tower sprang like that of a flying buttress to meet and support a pinnacle in the centre.

These examples of crown spire are very rare but they give the impression of being properly supported and are of a strong as well as a pleasing form.

The building of many of our finest spires in London, which are in existence to this day, was due to the position of Sir Christo-

pher Wren as an architect. All Wrens spires stand well on the ground for he never was guilty of placing his spires astride on the portion or thrusting them through the roof.

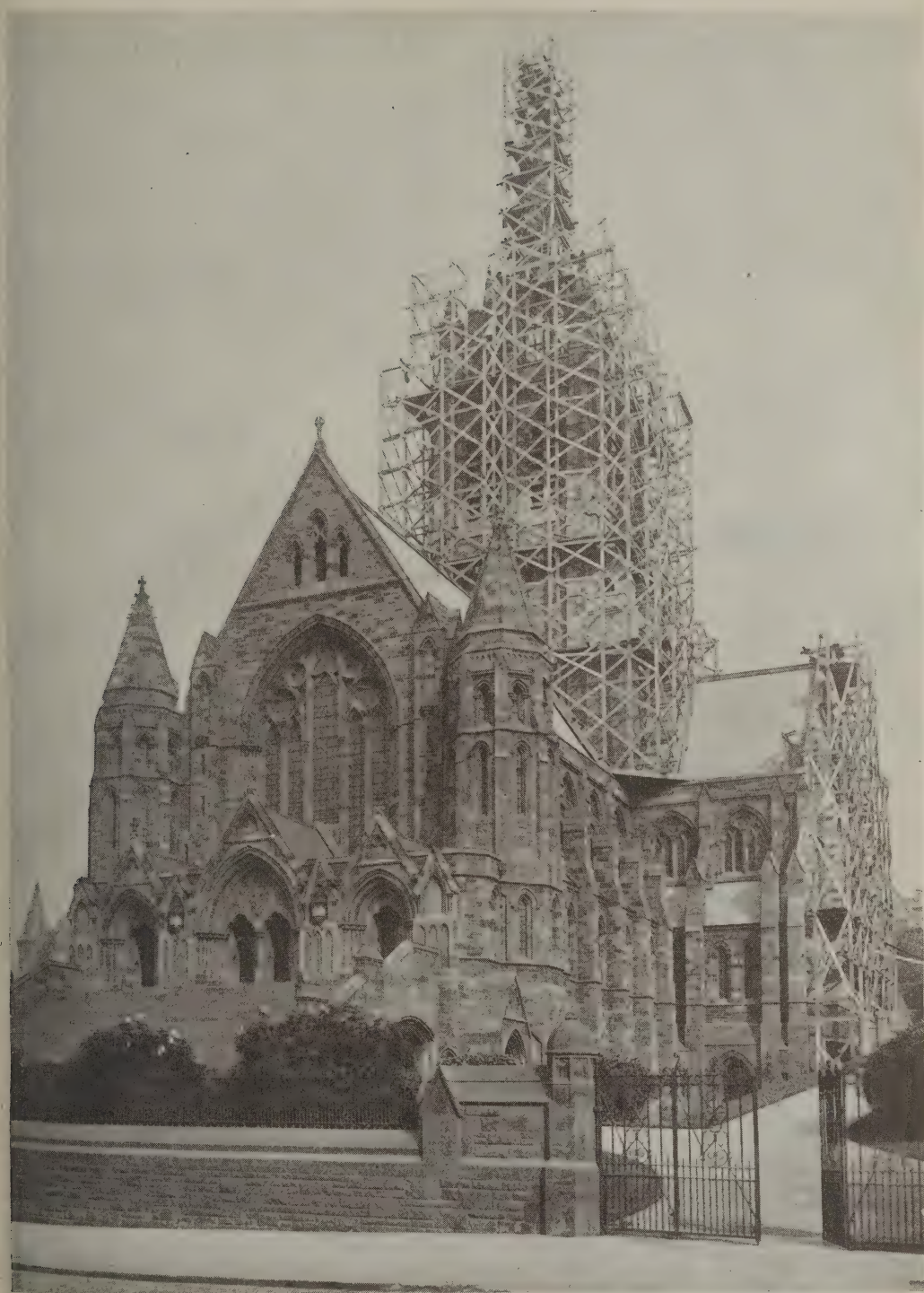
The spire at Bow Church, which is one of Wren's best, consists of a plain square tower 32 feet 6 inches wide by 83 feet in height above which are four stories, averaging 38 feet each. The first, a square belfry adorned with Ionic pilasters, is 39 feet, the next, which includes the beautiful circular peristyle of twelve Corinthian columns, is 37, and the third comprehends the small lantern and is 30 feet high which is also the height of the crowning pinnacle. The whole making up a height of 235 feet.

This spire might challenge comparison with any Gothic example ever erected. Indeed even as it now is, there is a play of light and shade and a variety of outline and an elegance of detail which it would be very difficult to match in any other spire.

There is no more greater proof of Wren's genius and his constructional ability than to observe that after he had set this example not only has no architect since his day surpassed him but no other modern steeple can compare with this either for beauty of design or appropriateness with which classic details are applied to so novel a purpose.

In the building of those spires the most of the work is in ashlar, the stones being cube and all specially wrought for their place. In forming the sloping surfaces the bed joints are all at right angles to the slope and the upright fronts vertical. Of course, many special stones are required to be wrought over and above the quoin stone and this is specially so in a broached tower and at ornamented parts. In the building of a covered spire the flying buttresses of the upper part are fronted in much the same way, as then the buttress is used in the side walls of the church.

The underside of the buttress is built with arch joints while the upper part, which is straight, is fronted in the same way as



The repairs of a high church spire requires careful and extensive scaffolding.



a skew cope when square bonding unites the under and upper part of the buttress.

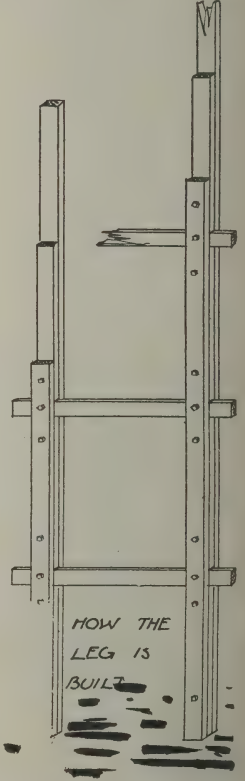
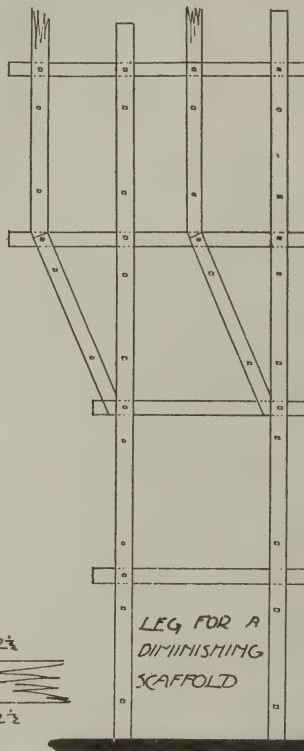
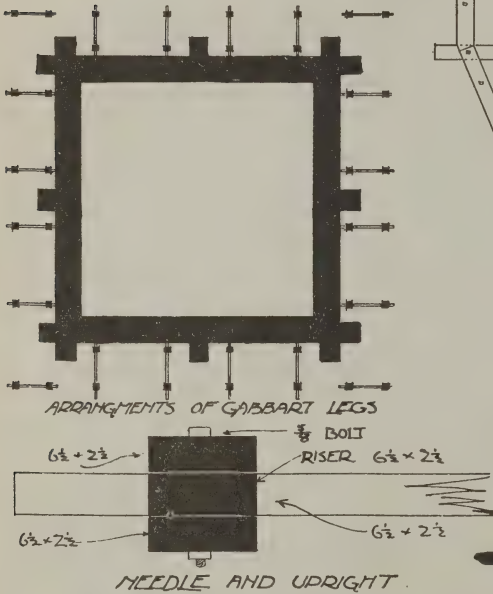
At the junction of the flying buttresses one large built key stone brings the various members into equilibrium and it is on the top of this key that the fronts of the crowning pinnacle or tower are tabled and cemented together.

The most of those spires at the present time are provided with lightning conductors, the proficiency of which is in proportion to the sectional area of the metal

modern spire is the final, which in the most of cases is made in copper ornament mounted on to a heavy bolt. This bolt is socketed in the top courses of the masonry, a hole being cut in the stone as it is being built. In that case, after the top course of the spire is set, the final is hoisted sufficiently high to allow the bolt to slip into its stone socket when the hole is grouted with cement.

In other cases the final bolt is sufficiently long to go right through the solid courses

## GABBART SCAFFOLDING



employed. Copper, having a high relative conductivity and being comparatively free from oxidation when exposed to the atmosphere, is the best metal for the purpose and the best forms are those made in the shape of tapes, as being long in length without joints they are less liable to get out of order than jointed ones.

The earth termination should be taken some depth into moist ground or water and have a large area of contact, consisting of a copper plate about nine feet square riveted on to the end of the conductor.

Another very important feature in the

at the top and is fixed up in position by the usual nut attachment in the inside of the spire, a large washer being used next the stone.

The possibilities of spires getting out of repair necessitates the question of their renovation being discussed. The method of repair depends to some extent on what has gone wrong and in many cases the final and top courses of a spire has been repaired by ladders and special detachable staging at the top.

These are the ways of steeple jacks, but when it comes to the general overhaul of

the fabric of the tower in which the mason is to be employed the question of the scaffold to be erected is almost as vital as the renewing of the decayed stone.

In this part of Britain we have two types of scaffolds in common use. The pole scaffolds of England in which the builders use the natural timber with large hemp or wire ropes and dogs for their ties, whereas the Scottish builder uses sawn timbers with bolts for his connection. With the first method little or no damage is done to the wood and it gains thereby a little longer life in practical use. With the Scotch method a scaffold once put together must necessarily go together again to nearly the same design as the bolt holes must not be too frequent. Still this is the method which is finding great favor in Southern Britain, noticeably the derrick staging which is built on the same lines as the gabbart scaffold, know colloquially as the Scotchman, is now to be found in erection in England every day.

This type of staging is shown in use in the half-tone illustration of the Coat Memorial church while the crown spire is to be renovated and the method of building is shown in the line drawings. Each leg of the gabbart is a complete frame in itself and is arranged with needles at easy stages in the height.

In building those legs the two outer parts of each post are in different lengths so that the fronts are broken bond throughout the entire height. Then another point is the

needle next the wall projects twelve inches past the line of the leg which allows the work to be carried out behind that part of the scaffold. The method is shown how the scaffold legs are diminished so as to allow the scaffolding to follow the outline of the tower.

One great advantage of this type of staging is the ease in which the scaffold can be raised so that with light material and a few workmen the top of the spire is soon reached. This type of scaffolding is independent of the wall so that no holes have to be left out to be filled in when the scaffold is struck.

In the renovating of old spires much new facing requires to be done and before those new stones can be placed the old ones must be cut out and in cases where the greater part may have to be renewed horizontal chases should be cut to receive the thicker courses of new work which bond the new work to the old. In such cases the hoisting of material has to be carefully provided for and the time is now ripe for electric hoists being installed in such scaffolds to convey workmen, mortar and smaller material to the different levels.

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"Say, mamma," queried the small son of a labor agitator, "is it the thunder that strikes or the lightning?"

"The lightning, dear," was the reply.

"Oh, well," replied the youngster, "I suppose the thunder doesn't belong to the union."



The Bungalow effect is easily carried out in cement stucco.



# Equipment for the Contractor

SOME of the most noticeable differences between construction today and that of a few decades ago are in the speed of erection, accuracy in construction and refinement of detail. Formerly a building of any pretention required years for its erection where now only months are required. Errors in construction, floors out of level, columns out of line or difference in their dimensions, varying story heights, etc., were almost common enough to be called general. Some writers ascribe these errors to an "artistic eye" which modern designers are unable to appreciate. Modern buildings show a large amount of refinement in decoration also, carried out in costly materials as well as in the simpler ones.

Through these years the cost of buildings has gone steadily down, notwithstanding the steady increase in wages and cost of materials.

How has it been accomplished? In brief words, by machinery. Hand work has been

largely superseded by machines, and still the finished building has a much better appearance. A building can be finished beautifully and artistically for a small increase in cost over a plain building.

Just as competition has lowered prices and improved appearances, so it has increased the use of machinery. No contractor could see his competitor get the good jobs, because he had the necessary machinery and equipment, without getting busy to fix up his own plant, and he likewise was ready for the coveted contracts.

No apprentice is content to remain an apprentice. No laborer is satisfied to forever handle a pick or shovel, and no contractor is willing to remain the same year after year. Each is successful as he progresses, becoming proficient in more lines and taking larger and more varied contracts. The apprentice and the laborer must buy tools and devices, the contractor machinery, appliances and equipment.

From the mine or the woods where the



Brick and stucco blend well for the exterior.



Stucco Houses in the closely built up suburbs are protected from outside fires.

raw materials are obtained right through to the final acceptance of the job, when the owner drives up in his limousine and the contractors in their motor trucks, tools, machinery and equipment play an important part. Last month we outlined some of the service obtained by the use of woodworking machinery, this month particular attention will be paid to the mason and concrete worker's equipment.

The equipment which a concrete worker purchases must bear a direct relation to his line of work. If he specializes in stucco he has little need for large mixers or conveying apparatus, while if his work is mostly on concrete silos, he will not need many power pumps. The average contractor, however, must be prepared for a variety of work. He will have foundations, walls, chimneys, stucco, whether on brick, concrete blocks, reinforced concrete, wood or metal lath. He may get occasional or numerous sidewalks and pavements, retaining walls, and frequently an entire reinforced concrete building, with walls, floors, columns and roofs of concrete.

It is perhaps fortunate for the contractor that there is a logical division of his work.

He may *specialize* in any one of a dozen lines, and yet be prepared to carry on other work in some of the other lines. Thus the sidewalk contractor readily lays concrete or terrazza floors, and the contractor who hustles in the foundations and basement walls is ever ready to build a concrete silo. How much variety a contractor should undertake depends upon the amount of each which he can readily get to do and he will be justified in purchasing additional equipment whenever there is sufficient work in prospect.

#### THE CONCRETE MIXER

Probably the first *machine* a contractor buys is a mixer. He sees their value on even the smallest job, and a few yards a day warrants their use. He has a wide variety of styles to choose from and all of them will do far better work than hand mixing. Just imagine how much better a batch would be if turned over fifty times than if turned only two or three times. The value of concrete depends upon a *thorough* mix, and you simply cannot get it by rolling the pile over and over. The mixer tumbles the mass over and over and practically grinds the ingredients into each other.





Large Grounds display a Stucco Residence to advantage.

#### STYLES OF MIXERS

There are mixers small enough to be turned by hand, and others which will take several yards at a filling. Some are fed by shovels, while others swallow cart loads of raw materials. Some fill a wheelbarrow, while others require massive trucks to carry away the mix. Some are readily portable for place to place or job to job, while others are built in solidly. With some the materials are brought to it, and the concrete dropped into place, while others require elaborate conveyors which carry the concrete all over the job. Continuous mixers require only that the hoppers be kept filled to insure a steady stream of well mixed concrete, while batch mixers as a rule have the materials measured for each batch. This can usually be done while the mixer is running or being discharged, so little or no time is lost.

#### WHO NEEDS EQUIPMENT

We are not particularly concerned with the contractor who wants to get into big work. He *knows* the necessity for adequate equipment and will have it before undertaking very large work. The smaller man,

however, does not always appreciate the value of sufficient equipment and it is to him these remarks are particularly directed.

While care in the proportioning, mixing and placing will go a long ways toward making a water tight wall, it will still stop short of it. There are a number of water-proofing systems by which an impervious wall can be obtained, and the conditions must be carefully considered before deciding which to use and how to use it. Some of these systems depend upon a material mixed with the concrete of such a nature that the smallest space is filled with an impervious substance, and no water or dampness can come through. Other compounds are intended to be mixed only with the finishing coat, in a rather rich mortar, the idea being that the surface being water-proof, nothing can get through. There are several excellent paints or coatings also on the market. These have the additional value of giving any desired color to the surface and many pleasing combinations of color, paneling and decoration at a very reasonable cost. The introduction of color to concrete is one of the features which will soon be developed in this line of con-

struction. Form permanence and weather-proofing has been accomplished, and *color* will be the final touch of art.

#### METAL LATH.

The introduction of metal lath started an important phase of construction. While "stucco" has been well and favorably known for hundreds of years there was more or less objection to its use as an exterior material. The weather, frost, rain, heat and dampness seriously affected it, especially in the northern states, while the salt air along the coast has had a bad effect upon some mixtures. It has been found, however, that when the proper materials are mixed and applied in accordance with the best practices that a stucco surface is adaptable to any climate, and possesses the weathering qualities as well as the appearance which modern owners insist upon.

Stucco requires a backing material and builders have used common brick, rubble stone, cement, either as blocks or monolithic walls, as well as wood and metal lath. The latter term covers a number of basic materials but is generally confined to iron or steel, either plain, painted, galvanized or sherardized. The metal itself may be in the

form of wire, cloth, expanded or pressed metal. Each form is designed to allow the mortar or stucco to be pressed through to form a key as well as to more or less thoroughly imbed the metal, protecting it from direct exposure to the air. On another page we give the results of elaborate corrosion tests to determine the value of various forms of metal lath. While these tests are not entirely complete they indicate the value and permanence of metal lath for such construction.

Stucco, being a covering to a certain extent, disguises its supporting material, so one cannot tell from a superficial examination just what the backing is or its location. There is such an opportunity for the use of improper materials, and the abuse of good materials, that the contractor must be posted, not only on the use and application of stucco, but also the backing, whether masonry, wood or metal. Good work must be done all the way through or the whole structure fails in its purpose.

Why should the contractor have sufficient machinery and equipment? There are four reasons, the owner, the architect, the men and *himself*.



Ornamentation, by piers and panels and pilasters, is easily accomplished in stucco.



The owner is interested because it shows that he is getting the best class of work. He can see the concrete quickly and accurately mixed, can see it placed in position rapidly, and the whole job pushed vigorously. His money is tied up in a building under construction for the shortest possible time, and he believes he will get possession weeks earlier than if he waited for slower methods.

The architect is concerned in the time the job consumes. Every week or day less means a saving of his time. He can watch machinery easier than men, and can be sure the right materials are being properly used. The quantities of materials used can be checked much easier than when only hand methods are employed, while the quality can also be kept track of. The busy hum of machinery is music to him, for it means progress with the work.

Only a given amount of work can be obtained from men. The fatigue point is early reached. With machinery, vastly more can be accomplished and in less time too. The cheaper class of men can readily be drilled into systematic use of machinery, bringing in the raw materials and tamping it in place, while they are hard to keep humped up over a shovelling board or pushing a line of wheelbarrows. Unquestionably the men appreciate the use of machinery, and will do more and better work with it than they would think of doing by hand.

Should the contractor consider his own feelings? Most certainly. He is interested in getting his work done on time or sooner. Machinery and equipment are necessary. The owner must be pleased, the architect must be satisfied and the contractor's men must be kept in a good humor. What will

do it better than plenty of suitable machinery, pumps, mixers, conveyors, auto trucks, scaffolds, derricks, etc.?

What riles an owner more than to see nice days go by with little work done because men are scarce who will shovel concrete all day? A little noise of industry about the building sounds good to everyone and advertises the contractor as being on the job. Payments are easier to get and the acceptance of the job on time or ahead of it, is a good thing for everybody and possible only by the use of machinery and suitable equipment.

#### RESPONSIBILITY.

Some one must take the responsibility for every job, and why not the mason or concrete contractor? He can handle the excavation, foundations, walls, chimneys, plastering, concrete and tile floors. Machinery is used for all of these items, and he has it. Why not control the job, and get the general contractor's percentage of profits? Some one must do it and with the equipment, he can easily handle it. The important thing on a job is in getting *started* right. That is up to the mason or concrete contractor. Why not see that the job is *finished* right as well?

#### THE GENERAL CONTRACTOR'S ADVANTAGE.

Why does the general contractor get ahead faster than the sub-contractor? Because he has one less man to answer to. Because he directs the entire job himself and is the man held responsible. Everyone knows him and he gets more work on his past reputation and records. He is known as "The Contractor," while the sub-contractors are the carpenter, the plumber, the painter, etc.



Stucco gives the architect the widest latitude for design.



A "complete-on-one-floor" Bungalow. Designed and Built by Commonwealth Home Builders.

## Little No-Stairs

*Ben F. Cobb*

If I were going to build a House,  
Says I to Myself, says I,  
I'd Build the Rooms all on the Ground  
Not stick them up in the Sky.  
I'd build a Bath, a Dining Room,  
And as for Porches, Oh my!  
I'd build them all around the House,  
Said I to Myself, said I.

Looking at the picture of the house with this article I am reminded of what an acquaintance said to me several years ago. We were speaking of convenient houses that were, at the same time, comfortable, and he made this remark: "When I build my ideal home I will build a bath room and build the other rooms around it and most of the other rooms will be porches." I do not know where this gentleman is today but if I did I would send him this copy of THE NATIONAL BUILDER so that he might see one house plan that comes near to his idea.

However, man is a creature of moods and subject to changing conditions. In the summer he thinks of his daily cold bath and a cool place to lounge, and in the winter he thinks of a warm house and a cheerful fireplace. With the plan of the house shown here both summer and winter are provided for.

Much can be said in favor of the small compact house without stairs. For one thing it makes the housewife independent of help. It was not until the day of flat building arrived that the architect or the owner thought of planning the house with all of the rooms on one floor. A house with all of the rooms on the ground floor and nothing above but the roof makes an ideal home.

Landlords of five to ten story apartment buildings claim that the top floor is the most desirable. An elevator brings you up and the air and light is better than anywhere below. Perhaps the landlord is right but we are not dealing with apartment buildings now, we are writing of a real home on the first floor with no families about to pour water on us.

Realizing the small extra cost of the second story has made many an owner go to the little additional expense and give his wife stairs to climb. It has often been said that cars on our streets and elevators in our buildings has been the means of making us a nation of lazy people. I hardly think this is true. It has simply changed our habits and I judge this from the fact that the same man who thinks he must board a street car to ride three blocks



will walk ten miles on a golf course and think he is having a time of his life.

What a saving of time it would be if we could have a golf course laid out between the resident and the business districts of our cities. By the way, did you ever hear of a woman who kept house on two floors and did her own work pinning to play golf? I think not. House work is bad enough, but house work with stairs to climb does not create a demand for golf clubs.

I seem to be wandering today in my writing but every time I look at the picture of this house I am impressed with the comfort that the architect and builder has provided. I can imagine myself enjoying a rest in a hammock on one of those porches and allowing my mind to travel at will.

I presume this house is built in Los Angeles as it has been built by a Los Angeles company. At all events it is located in southern California and it is an ideal house for the southern California climate. There is no reason why the same kind of a house could not be built anywhere, although storm windows would be necessary in some sections, and there might be too many porches for a cyclone country.

For a conveniently arranged home there seems to be nothing left to wish for and this is the work of an architect who has spent his life in study along these lines. Architecture has come to the front wonderfully within the past few years, and it is one of the most interesting of studies.

To be a successful architect one must have an eye for the beautiful, as well as a general knowledge of what his productions are to be used for. In other words he must be both an artist and a mechanic, and if he can add to these a fair share of business ability his success is assured.

Some architects run strong to the artistic and whether they do or not they all are like artists in one way, they leave their imprint on everything they do. That is to say, each one has a style of his own that he seldom gets away from. If he is a progressive studios architect he will improve on his style and improve on his methods, but as the old lady said about the bad boy, "What is bred in the bone can't be beat out of the flesh."

All this is not so much to be wondered at. An art critic can pick out the work of any artist whose paintings he is familiar with, and it is equally as hard for a writer to get away from his style. The architect has done more than anyone else towards beautifying our cities and occasionally in riding through the country we find samples of their handiwork that makes us feel glad that they are making inroads into the country as well.

When we find an architect who can plan the home showing as much art and such a combination of conveniences as we have here we may look for even better things in the future for there is no limit to what can be done on these lines. Perhaps some architects may take exceptions to that remark of mine in regard to their being no limit to what can be accomplished by them but I hardly think so. At all events not if they will take time to look back a few years and note the improvements that have been made.

Someone suggests that one of the comparatively new conveniences of the modern house is the sleeping porch, and in a certain sense it is, but sleeping out of doors must have been common long before the days of houses. In reality only the name of sleeping porch is new.

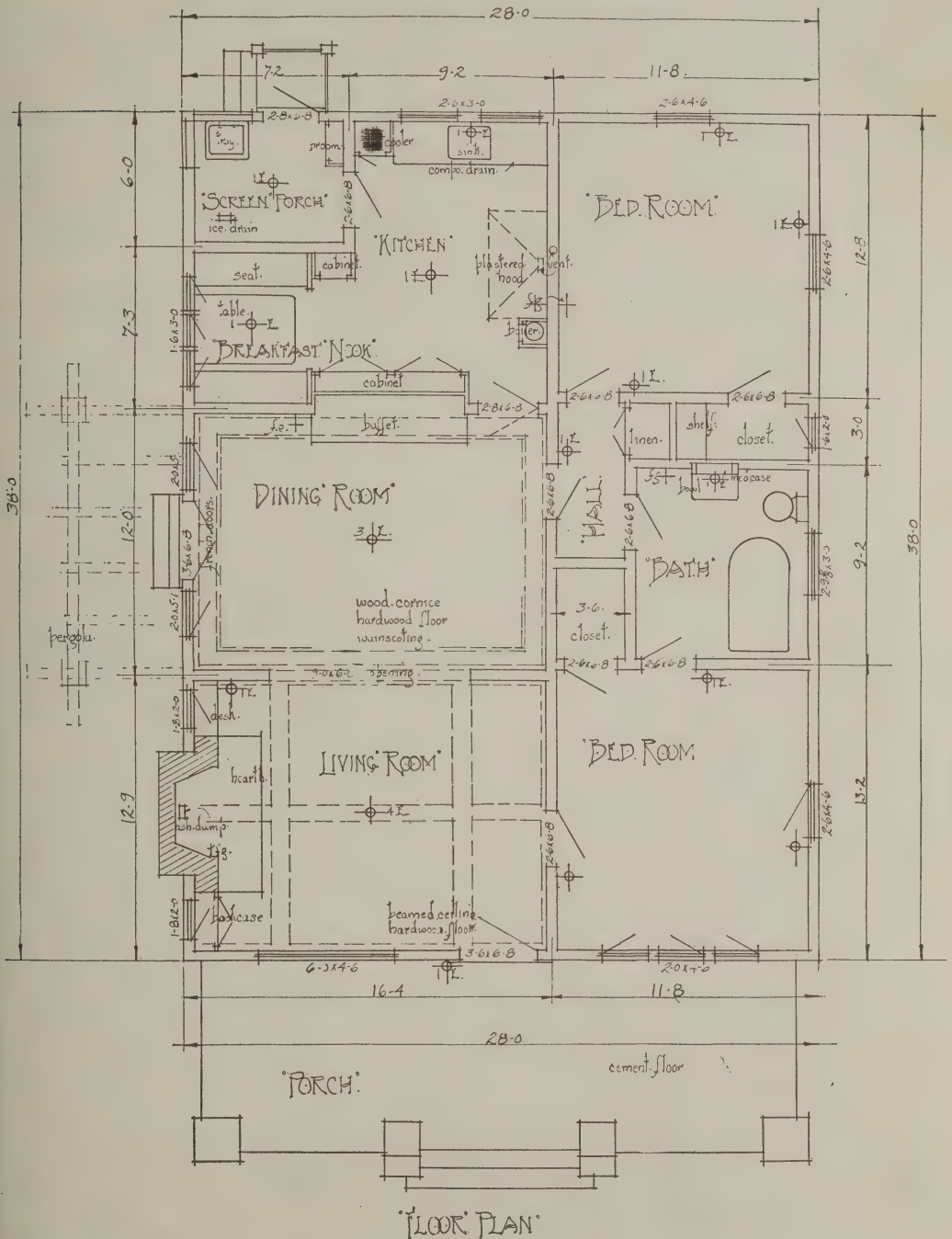
In the south where most of the houses are built with a big hall running through them, and in many cases, open at both ends, these halls have been used for sleeping porches for years. In fact, one of the blessings of the poor man of the south who has no roof to cover his head is that there is but very little time during the year that he really needs one. With the blue canopy of heaven over him he has the original sleeping porch, planned by the architect of the universe and built by the same hand.

This architect also gave us the bath under the same canopy but we think we have improved on the original conditions some by putting the bath as well as the sleeping porch under our home roof. No doubt we have to some extent but there are extremists in every line.

A short time ago I was looking over the building of an owner who evidently

believed in economizing space. His bath rooms were only wide enough to take in a small sized tub and the bather was necessarily obliged to climb over the end of the

same. Eight or nine feet square ought to be the minimum size for a bath room, and one twelve feet square would suit my ideas much better.





# Wardrobes

*Chas. P. Rawson, Architect*

**W**ARDROBES are without doubt again coming into fashion. The best architects and designers of interiors are using them. One of the latest arrangements is to have a pair of wardrobes on either side of a window or a mantel, or one at each side of the head of the bed, or at the head and foot when the bed is placed sideways against the wall. Usually they are built in and match the rest of the interior finish, but sometimes they are detached and then they may be made to match either the trim of the room or the furniture.

One of the best ways of securing cleanliness and order in a house is to provide plenty of closet space, and by this I mean usable closet space. Much of the space in the ordinary clothes closet as usually built is entirely wasted.

A bedroom has been recently designed in the east which had the entire wall space fitted with panels which opened into closet space. Some were fitted with rods and pegs for clothes and others were provided with drawers and boxes with hinged doors.

We have shown in the accompanying drawings several schemes and arrangements for wardrobes. Figures 1 and 2 show them placed at the side of the bed head and on either side of a window. The detail of the shelf shown on Figure 1 will apply to both cases where clothes are to be hung. Suits or dresses should never be hung on hooks and therefore rods for wire hangers are provided.

It is intended to have the doors of wardrobes shown in Figure 1 of glass, set in a removable frame, which may have colored chintz curtains behind which will match other draperies or decorations in the room. These curtains should be fastened by tacking at both top and bottom of frame. The

inside of the doors are provided with plain plate mirrors. The detail, drawn one-half full size, shows the construction of these doors.

One of these wardrobes is fitted up as a dressing chest of drawers below and a group or rather two groups of drawers and boxes above, with a mirror between them. The table top may be made to slide in and out or side slides like a desk could be supplied to advantage.

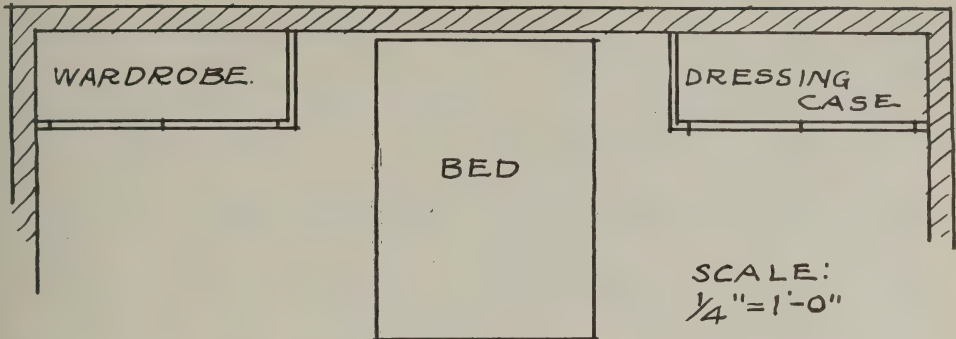
One of the wardrobes shown in Figure 2 has the entire space filled with boxes and drawers. The doors have mirrors on the outside. A window seat is provided between the cases and has a hinged top which makes a convenient skirt box.

A detail, which will apply to other cases as well, showing the construction of the box fronts and drawers, is also shown on Figure 2.

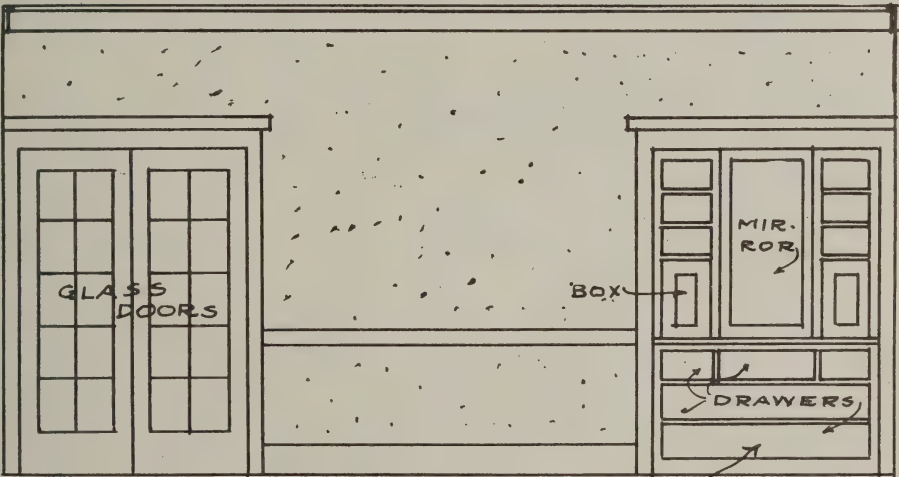
Figure 3 shows the wardrobe idea on a less elaborate scale to residences and apartments and may be used wherever two bedrooms adjoin. The doors may have mirrors or not. There is a case at one end of each wardrobe. This case which is shown in section and elevation has drawers, cases with doors and open shelves. Each wardrobe has a pole and row of hooks.

The return of the wardrobes is one of the many changes in bedroom arrangement for which the fresh air is responsible. Many of the out-door-sleeping enthusiasts went so far as to remove the bed from the bedroom entirely and its position was occupied by a wardrobe or high-boy and the bedroom became a dressing room in connection with the sleeping porch. This has started a fashion which should have the hearty approval of every architect and every housekeeper.





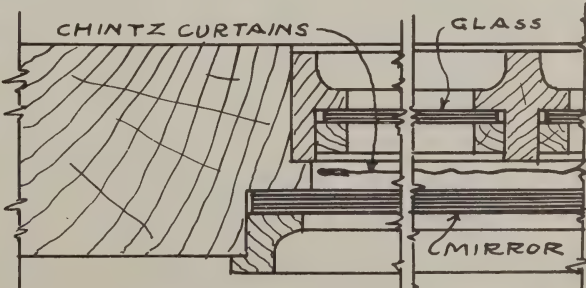
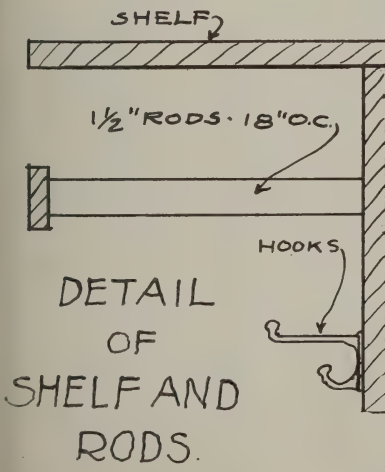
PLAN



ELEVATION

DOORS REMOV. ED TO SHOW INSIDE.

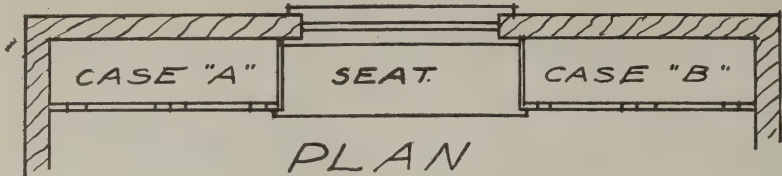
WARDROBE AND DRESSING CASE.



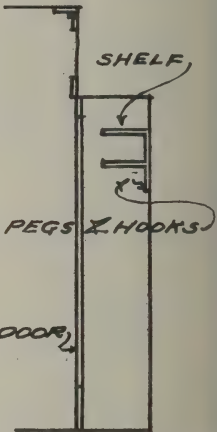
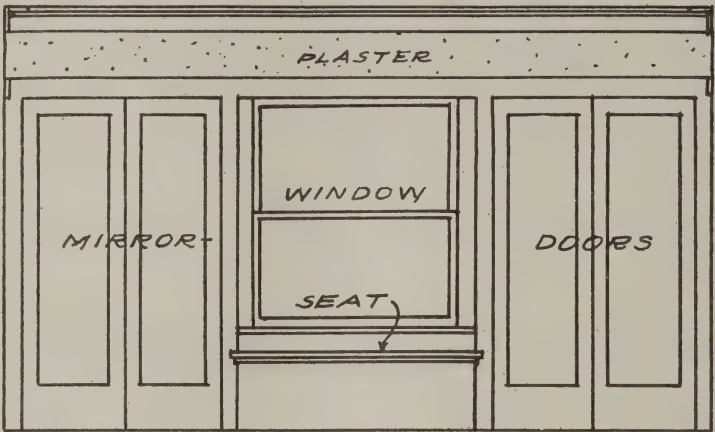
DETAIL OF DOOR

SCALE:  $\frac{1}{2}$  F.S. CPR-141-15



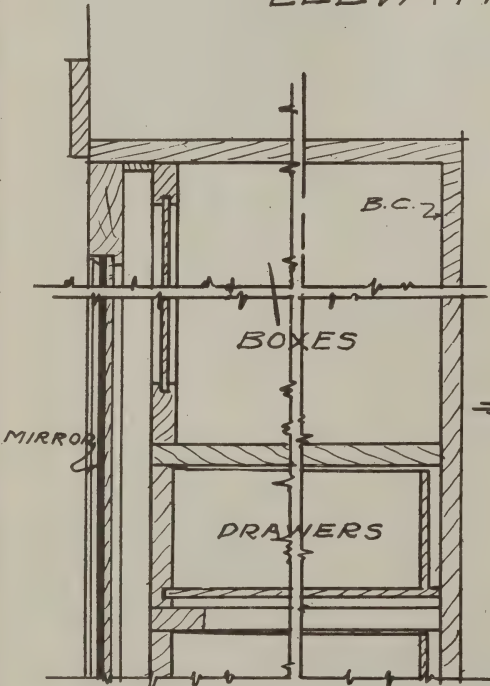


SCALE  
 $\frac{1}{4}" = 1'-0"$



ELEVATION

SECTION "A"

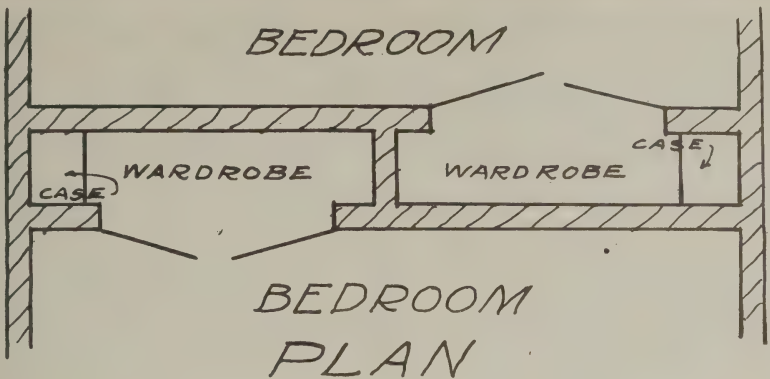


DETAIL  
SCALE:  $1\frac{1}{2}" = 1'-0"$



ELEV. SECTION "B"  
OF "B" WITH DOORS  
REMOVED.

WARDROBES  
AND WINDOW SEAT



SCALE:  
1/4"=1'-0"

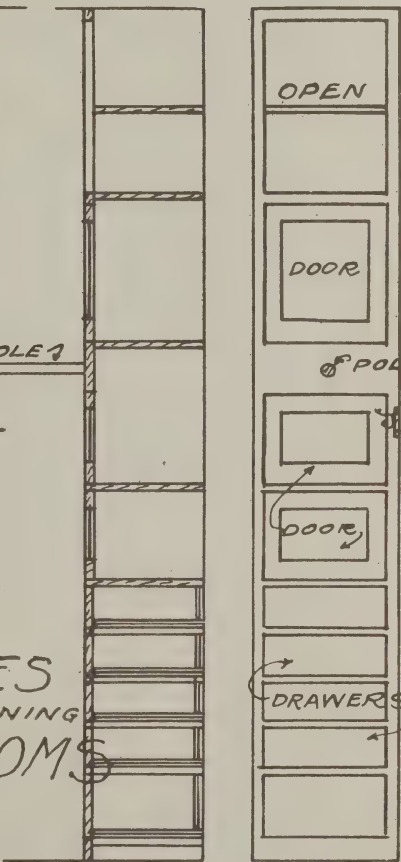


ELEVATION



SECTION

WARD  
ROBES  
FOR ADJOINING  
BEDROOMS



SECTION AND  
ELEVATION OF  
CASE



# Some Comparative Corrosion Tests of Plastered Metal Lath

## A PROGRESS REPORT

By J. C. Pearson, Assistant Physicist, Bureau of Standards, Washington, D. C.

ABOUT three years ago the Bureau of Standards was requested by the Associated Metal Lath Manufacturers to co-operate with them in determining what factors play the most important part in bringing about the corrosion and consequent failure of metal lath under stucco and plaster.

At that time it was represented that failures of metal lath were sufficiently frequent to be a matter of concern to the lath industry, and that many were openly condemning the use of this material on the ground that its tendency to corrosion rendered it unsuitable for permanent construction. Reliable data were not at hand on the relative value of protective coatings for the lath itself, nor on the corrosive properties of different plasters, nor on the best methods of construction for the preservation of the lath. Information was needed on these points, not only by the lath manufacturers but by all interested in building materials.

The Bureau of Standards was at this time conducting corrosion investigations along certain lines, and it was felt that the program might readily be enlarged to include a series of comparative tests on the corrosion of metal lath. Recognizing, however, that the public might have an unusual interest in such tests, in view of the increasing popularity of stucco construction, the Bureau signified its willingness to undertake the work, not as a private test but as a part of its investigative work, with the understanding that the results should be available to the public. The lath manufacturers not only concurred in this arrangement but also agreed to provide all samples of lath required for the tests.

### PURPOSE AND PROGRAM OF TESTS

In developing the plans for the tests it was proposed that the chief aim and purpose of the work should be, as already indicated:

1. To determine the relative protective value of various coatings for the metal lath as compared with their actual cost.
2. To compare the corrosive properties of various types of plaster.
3. To determine whether ordinary methods of construction are adequate to insure the durability of the lath, and to investigate other methods.

A preliminary program was also laid out, the essential features of which were as follows:

First. The tests should be primarily qualitative, comparative corrosion tests of metal lath, embracing as many different varieties of mesh, coating, etc., as possible.

\*From the Journal of The American Concrete Institute.

Second. The samples of lath should be erected in panels and plastered with a number of different plasters typical of those in common use.

Third. The lath should be supported in such manner that the backs of the panels should be open to view. Thus the progress of corrosion

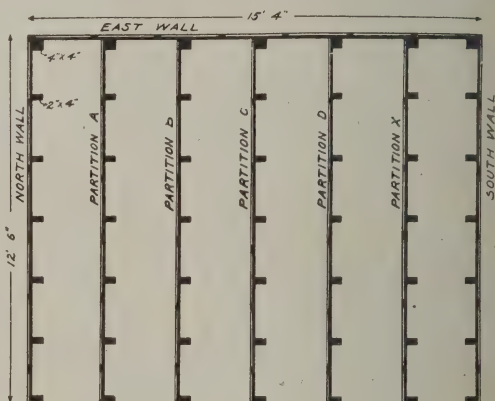


FIG. 1  
SHOWING PLAN OF WALLS AND PARTITIONS CARRYING PANELS

could be followed until it was deemed advisable to examine the condition of the metal actually imbedded in the plaster.

Fourth. It was decided moderately to accelerate the normal exposure by sprinkling the exterior walls during the summer months, and by

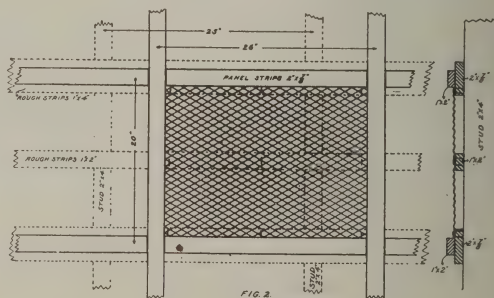


FIG. 2  
SHOWING PLAN OF PANEL CONSTRUCTION

having the interior panels exposed at all times to the out-of-door atmosphere but directly sheltered from the weather.

This program, as applying to the panels included in the original plans, was adhered to without change. A few of the panels, however, were erected with a modification of the open

back construction, which led to an extension of the work to include two other types of construction. These additional panels will be referred to later.

The present report is limited to a description of the tests and a statement of the condition of the lath after two years' exposure. As the progress of corrosion has proven to be slower than was anticipated, it has seemed best to wait, probably another year, before examining the condition of the lath actually imbedded in the plaster. The report, therefore, is based only on the appearance of the exposed metal and does not necessarily indicate the exact status of the tests.

#### CONSTRUCTION OF THE PANELS

A suitable location for the panels was found at the east end of a storage building on the brow of the hill south of the Bureau's Engineering Laboratory. In this manner a north, east and south exposure was obtained for the exterior panels, whereas the interior panels were erected on partitions parallel to the north and south walls, inside the latter and abutting on the east wall. The dimensions and general appearance of the walls and partitions carrying the panels can be obtained from the layout plan, Figure 1, and the photographs, Figures 3 and 4. The exterior panels number 132, of which 119 are nearly the regulation size, 18x24 in., the remaining 13 being somewhat less than half this size and added to fill up an otherwise empty space. Some of the smaller panels may be seen just at the left of the door in Figure 3. The interior panels number 150, all of which are practically full size.

The construction of the panels is shown in Figure 2. By mounting the lath on strips, as shown, furring was not required and more than three-quarters of the panel was left exposed on the back, thus affording access for examination of the key of the plaster and the condition of the metal.

Some criticism has been offered of thus having the lath exposed, on the ground that very little actual construction would permit such a free circulation of air and moisture at the back of the lath. It was felt, however, that if results were to be obtained within a reasonable period, say not over five years, some method of moderately stimulating corrosion must be adopted which would not be open to the criticism of highly accelerated laboratory tests; and no better method suggested itself. Further, as already stated, the open back construction served the double purpose of helping matters along and at the same time allowing one to see what was going on.

#### MATERIALS FOR THE TESTS

In the selection of the materials for the tests we were especially indebted to Mr. H. B. McMaster, Commissioner of the Publicity Bureau of the Associated Metal Lath Manufacturers, for providing the samples of metal lath, and to Mr. W. W. Shearer of the Rosslyn Supply Company of Washington, D. C., for assistance in selecting and procuring the types of plaster. To the latter also the writer was especially indebted for much valuable advice during the progress of construction of the panels.

For convenience in referring to the samples of lath used in the tests they will be considered as divided into "types," "classes" and "varieties."

Thus laths may be regarded as being of the same type when they have the same form of mesh, of the same class when they have the same kind of protective coating, but of the same variety only when they are identical in every respect. Different metals also constitute separate classes, as plain steel and ingot iron, but no distinction has been made thus far between the varieties of steel.

The samples of lath actually used in the tests were of 39 varieties contributed by eight manufacturers. Among these there were 9 types and 7 classes, as above defined. The expanded metal lath was for the most part 24 gauge, weighing 3 lbs. or more to the square yard. A few special types of stamped lath were also included which are generally heavier than the expanded lath.

Table I gives a complete list of the samples of lath used in the tests.

The foregoing list does not include all the varieties of lath submitted, some of which had to be

TABLE I.—LIST OF THE VARIETIES, TYPES, CLASSES AND MANUFACTURERS OF THE METAL LATH USED IN THE CORROSION TESTS.

Sample No.	Type.	Class.	Number of Panels.	Manufacturer.
1	True-loop	Painted	6	Bestwick Steel Lath Company.
2		Galv. (before exp.)	4	" " " " "
3	Diamond	Painted	10	" " " " "
4		Galv. (before exp.)	10	" " " " "
5	Herringbone	Plain	14	General Fireproofing Company.
6		Painted	6	" " " " "
7		Galv. (before exp.)	6	" " " " "
8		Shearadised	6	" " " " "
9		Plain ingot iron	12	" " " " "
10		Painted	8	" " " " "
11	Boston	Plain	6	" " " " "
12		Painted	7	" " " " "
13	Key	Plain	7	" " " " "
14		Painted	8	" " " " "
15		Galv. (after exp.)	6	" " " " "
16		Plain (anti-rust)	13	Sykes Metal Lath and Roofing Company.
17	Cup	Painted	6	" " " " "
18		Galv. (before exp.)	6	" " " " "
19	Modified Diamond	Plain	10	Consolidated Exp. Metal Companies
20	Diamond	"	10	" " " " "
21	Knob-burn	"	9	Northwestern Exp. Metal Company
22		Painted	4	" " " " "
23		Galv. (after exp.)	5	" " " " "
24	Cup	Plain	5	Gary Iron and Steel Company
25		Painted	2	" " " " "
26		Galv. (before exp.)	5	" " " " "
27	Diamond	Plain	11	Eastern Exp. Metal Company
28		Painted	8	" " " " "
29	Emco	Plain	14	" " " " "
30		Painted	9	" " " " "
31	Modified Diamond	Plain	8	" " " " "
32		Painted	8	" " " " "
33		Galv. (before exp.)	6	" " " " "
34	Corrugated Diamond	Painted	5	Youngtown Iron and Steel Company
35		Galv. (after exp.)	4	" " " " "
36		Shearadised	5	" " " " "
37		Painted	5	" " " " "
38		Galv. (after exp.)	3	" " " " "
39		Shearadised	6	" " " " "

omitted on account of lack of space. One or two manufacturers also submitted samples too late to be included in the tests as planned, and such samples have been thus far used only in supplement at the close of this paper.

All the labor involved in erecting the partitions, laying out the panels, and putting the lath in place, was done by regular employees at the Bureau. As no plasterers were available, however, this part of the work was let out by contract. Practically all the plastering, both exterior and interior panels, was done by skilled workmen, the Bureau's only part in this being to specify what particular mixture should be applied to any given group of panels. Both exterior and interior plastering was two coat work, the second and finishing coat being for the most part sand or rough floated.

In the selection of plasters it was the aim to include only such types as were in common use. The mixtures, however, were arbitrarily chosen, and in a number of cases were not comparable with those used in practice. Therefore, the results obtained in these cases should not be considered



as necessarily in accord with the comparative results which would be observed in other mixtures.

A complete list of the plasters used, the proportions of their ingredients by volume, and their distribution, is given in Table II.

It is also understood that on metal lath the first coat, especially in the case of lime mixtures, should be richer than the second and finishing

TABLE II.—LIST OF THE PLASTERS APPLIED TO THE PANELS OF METAL LATH, AND THEIR DISTRIBUTION.

Plaster.	Proportions by Volume.	Number of Panels.	Location.
1. Cement, Ca. hyd. lime, sand.....	1:2:3	83	North and east walls
2. Cement, Mg. hyd. lime, sand.....	1:2:3	11	South wall
3. Alca lime, sand.....	1:4:2	15	" "
4. Cement, slaked lime, asbestos.....	1:2:2	8	North Wall Partition
5. Mg. hyd. lime, cement and sand.....	1:2:2	15	" " A
6. Ca. hyd. lime, cement and sand.....	1:2:2	15	" " B
7. Mg. hyd. lime and sand.....	1:2:2	15	" " C
8. Ca. hyd. lime, sand.....	1:2:2	15	" " D
9. Keene's cement, hyd. lime, sand.....	1:2:3	20	" " E
10. King's Windsor and sand.....	1:2:2	10	" " F
11. Ivory and sand.....	1:2:2	5	" " G
12. Ivory, wood fibered, neat.....	1:2:2	4	" " H
13. Ivory, wood fibered, neat.....	1:2:2	4	" " I
14. Acme, wood fibered, neat.....	1:2:2	11	" " J
15. Acme and sand.....	1:2:2	6	" " K
16. Slaked lime, cement and sand.....	1:2:2	6	" " L
17. Slaked lime, sand.....	1:2:2	6	" " M
18. Alca lime, sand.....	1:2:2	6	" " N
19. Slaked lime, asbestos.....	1:2:2	6	" " O
20. Special, ready mixed.....	1:2:2	6	" " P

NOTE.—It has been suggested that mixes 1 and 2 are slightly oversanded, and that mixes 4, 5, 9 and 10 are considerably oversanded, as compared with the proportions used in common practice.

coats. In these tests, however, the first and second coats are the same throughout, except for the omission of hair from the second coat. Thus the interior mixtures which are regarded as oversanded, are oversanded only with respect to the scratch coat. This is evidenced by a number of badly cracked panels covered with the richer lime mixtures, and by the excellent condition of the plaster in the Keene's cement and lime panels.

The magnesia lime referred to in Table II is finishing lime comparatively high in magnesia, and would not ordinarily be used in scratch or brown coats. It was included to see whether any appreciable difference could be detected in corrosive action as compared with hydrated high calcium lime or ordinary slaked lime. For the same reason also it was used in the exterior stucco. The plaster designated as "Special" is a gypsum plaster treated in some manner to eliminate its corrosive action. It was included at the special request of the manufacturers and may probably be considered typical of its kind.

TREATMENT AND INSPECTION

As indicated in the original program the only deliberate attempt to accelerate the tests was to sprinkle the exterior stucco panels two or three times a week, depending upon the weather, during the warmer half of the year. This program was carried out during the summer of 1912 and during the summer of 1913, until July. Three complete inspections and records have been made of the condition of the panels, and the status of the tests as presented in this progress report is based on the inspection of October, 1913.

RATING

It is very difficult to establish a system of rating to indicate the condition of the lath. Some types of lath are covered almost entirely by the key of the plaster, others are nearly all exposed on the back. In some cases the rust is fairly vigorous and local, in others it is less vigorous

but generally distributed. After some consideration the following scheme was adopted, not as an exact system of rating, but rather for descriptive and approximately comparative purposes.

- 10 indicates perfect condition, no rust.
- 9 indicates traces of rust only, in which no appreciable percentage area of the lath is affected.
- 8 indicates that about 1/4 of the exposed metal is rusted.
- 7 indicates about 1/2 of exposed metal is rusted.
- 6 indicates about 3/4 of exposed metal is rusted.
- 5 indicates all the uncovered surface is rusted.

Thus a rating of 9 or better indicates practically perfect condition. Numbers below 5 indicate only very roughly the advanced stage of corrosion. Thus 4 indicates that the rust is beyond the surface state and visibly eating into the lath, and 0 indicates practically complete failure of the lath. In only comparatively few cases has it been found necessary to estimate conditions below 5. These numbers have also been supplanted by notes on the general appearance of the rust if in any way worthy of remark. While the average represented by the ratings are not necessarily indicative of the true condition of the lath on its road to failure, no simpler method has suggested itself of describing the approximate status of the tests, and the average probably represent the actual conditions quite close enough for purposes of comparison.

PRESENT STATUS OF THE TESTS

It will be sufficient to present here a tabular summary of the data taken from the records of the October inspection, see Table III. In this

TABLE III.—CONDITION AND NUMBER OF PANELS OF EACH CLASS OF METAL LATH UNDER THE DIFFERENT TYPES OF PLASTER.

Plaster.	Galv. after Expansion.		Galv. before Expansion.		Painted Iron.		Painted Steel.		Sherardized.		Plain Iron.		Plain Steel.	
	Rating.	No.	Rating.	No.	Rating.	No.	Rating.	No.	Rating.	No.	Rating.	No.	Rating.	No.
<b>Exterior panels.</b>														
1 c. 1, 3	10.0	6	9.8	11	8.6	4	8.6	25	8.9	9	6.9	4	5.8	24
2 c. 1, 2, 3	10.0	1	9.8	3	8.5	8	8.3	5	9.2	2	7.5	1	5.0	3
3 c. 1, 2, 3	9.5	1	9.0	1	8.1	6	8.1	6	7.0	1	5.0	2	3.8	5
4 Alca, 2 sand	9.0	1	8.5	2	7.0	1	6.6	5	6.0	1	5.0	2	3.8	5
Average.....	9.8	9	9.6	17	8.3	5	8.3	49	8.4	13	7.0	5	5.4	34
<b>Interior panels.</b>														
6 1 Alca, 2 sand	10.0	1	10.0	2	9.2	2	9.2	2	7.5	1	5.0	2	3.8	5
7 1 c. 1, 2 sand	10.0	1	10.0	2	9.2	2	9.2	2	7.5	1	5.0	2	3.8	5
8 Ca. hyd. l., 1 c. 2	10.0	1	10.0	2	9.2	2	9.2	2	7.5	1	5.0	2	3.8	5
9 Special.....	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
10 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
11 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
12 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
13 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
14 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
15 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
16 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
17 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
18 1 c. 1, 2 sand	10.0	1	9.8	2	9.0	1	9.2	4	10.0	1	9.5	1	7.6	6
Average.....	10.0	9	9.6	17	9.3	3	9.1	35	8.3	6	7.0	7	7.6	73
Total Average.....	9.9	18	9.6	34	8.7	8	8.6	84	8.4	19	7.0	12	6.9	107

NOTE.—It has been suggested that mixes 1 and 3 are slightly oversanded and that mixes 5, 11, 17 and 18 are considerably oversanded, as compared with the proportions used in common practice.

table the average ratings of the different classes of lath are tabulated in order of excellence from left to right. The plasters are listed in the order of their apparent protective effect on the plain steel lath, this class being the largest and probably showing more pronounced effect than the others. The order is seen to be essentially the same for all classes of lath.

It must be remembered that at the present time it is not known what is going on underneath the plasters, so that conclusions based on the results presented in Table III are to be regarded as tentative only, pending later development. Examination of the table will show that the condition of the lath under the three representative brands, King's Windsor, Ivory and Acme, is almost entirely a general average condition of all the interior panels. That is, the corrosive action of the straight gypsum plaster appears to be less vigorous than was anticipated. The oversanded condition of the plasters containing the high calcium hydrate, the magnesium hydrate, and the Keene's cement may account in part for their low average rating, which in their proper relation to the other plasters would probably raise the general average, and lower the relative position of the gypsum group.

On the exterior walls all the cement stucco panels are in fairly good condition, whereas the alca lime panels are already beginning to fail.

sidered with caution until richer mixture has been tested.

Comparing the various classes of lath, it is seen that the galvanized lath is unquestionably in the best condition. There is also very little choice between the lath galvanized after expansion and that cut from galvanized sheets, nearly all samples of both classes being practically in perfect condition. It is believed that this is in accord with the theory of galvanized coatings, and probably a number of years will pass before any of the galvanized lath in durable plaster or stucco shows indications of failure.

The painted lath are in surprisingly good condition, as shown by the fact that their average rating is higher than that of the Sherardized lath. Some one has suggested that the painted lath may have been more carefully prepared for these tests than they are for the "trade." Possibly this may be true in some cases, but the same suggestion applies equally well to the other classes of lath, and in justice to the manufactur-

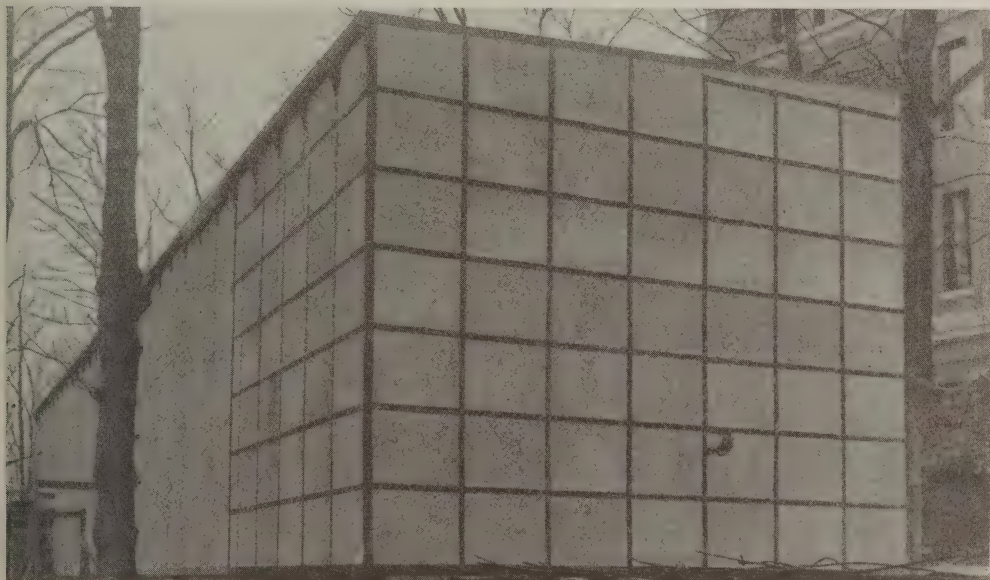


Figure 3. The End of the Test House.

In fact, the exterior alca panels are generally in worse condition, both on the face and back, than the figures indicate. This condition is probably due in part to the use of too lean mixtures. The 1:4 and 1:2 volume are approximately 1:9 and 1:4.5 weight mixtures, neither of which is quite as rich as the 1:3.5 weight mixture specified by the manufacturers for the first coat and 1:4 for the second coat. Another condition might have also contributed to the low rating of the panels, viz: some of them are situated on the south wall near the end, which, as already stated, was left open for a few months after erection. Consequently in the case of severe storms the backs of some of these panels may have been exposed to moisture during this period more than subsequently. Therefore these results should be con-

ers who submitted the samples, it may be stated that the only suspected variety of this class shows a condition of 8:6, which is exactly the average of all the painted lath together.

The Sherardized samples do not bear out the claims that are made for this coating. While most of the samples are in good condition, some of them are rusting vigorously, and the rust seems to be increasing. This is not in accord with statements that the Sherardized zinc coating may show an apparent incipient corrosion which soon ceases. It may be noted, however, that some doubt has been expressed regarding the quality of these particular samples, and further disinterested tests of this material are required to establish its comparative efficiency in protection against corrosion.



Unfortunately there was no "Toncan" metal or copper bearing steel lath on hand at the time these tests were started. The samples of painted and plain ingot iron are at present in very slightly better condition than the painted and plain steel, respectively. It is hoped that these may all be included in subsequent tests in order that more directly comparative results may be obtained.

Perhaps the most useful information resulting from these tests would be that obtained by comparison of the cost of the various classes of lath with their durability in any given plaster. But as the durability of the lath can now be only very roughly estimated, a comparison of this sort should be postponed until later. It is possible that some interesting data shall be obtained on this subject before these tests shall have been completed.

#### SUPPLEMENTARY TESTS

In this conclusion it is decided to describe very briefly some supplementary work in connection with these lath and plaster tests, from which, however, only preliminary results have been obtained.

During the winter of 1911 and 1912, 88 plaster blocks 6 inches square by  $1\frac{1}{2}$  inches thick, were made up with 22 different plaster mixes, the majority of them containing varying proportions of cement and lime, and gypsum plaster and lime. Four blocks of each variety of plaster were made and in the center of each block was imbedded a  $4\frac{1}{2}$ -inch square of plain steel lath. There were thus prepared four sets of blocks of 22 each. One of these sets was stored in an open cement box out-of-doors, the plan being to keep these partially immersed in water. Another set was stored in the damp closet, another in the comparatively dry air of the laboratory, and the remaining set was placed on a shelf over the partitions carrying the interior panels. It is the purpose to note the durability of the metal at the time of failure, and at some future time to examine all that have survived the various treatments. Unfortunately a number of the blocks exposed to water, and many of those stored in air were accidentally destroyed during recent alterations in the laboratory. These will probably be replaced as soon as new materials can be obtained.

In the summer of 1912 samples of some 15 selected varieties of lath were exposed to the weather by suspending them on a cable in the rear of the Engineering Laboratory. Last summer these specimens with a number of new ones were mounted on a rack in nearly the same location, where the progress of corrosion may be qualitatively compared.

In the spring of 1912, 35 additional panels were added on the south wall of the storage building for the purpose of testing out two methods of thoroughly imbedding the lath in stucco and to determine whether these methods may not be preferable to the ordinary method of plastering the lath on one side.

Twenty-one of these additional panels were plastered in accordance with the Typical Specifications,\* issued about two years ago by the Associated Metal Lath Manufacturers, the essential

feature of which was the fastening of the lath and furring directly to studs without the use of sheathing, the lath being back plastered immediately after the scratch coat had set.

The remaining panels were backed up with sheathing, the greater part of which could be removed after the plastering was finished. The outside of the wall was then covered with felt and over this  $\frac{3}{8}$ -inch furring was nailed to the permanent sheathing. The lath was then plastered as usual on the outside, but no hair was used in the scratch coat, and the stucco was mixed as wet as it could be and still hold to the wall without "sliding." This was well pressed into the lath to fill as completely as possible the entire space between the lath and the sheathing paper. After the stucco had hardened and dried out the removable sheathing was taken down and



Figure 4. Showing the side of the Test House.

the sheathing paper cut away, leaving a smooth cement surface wherever the application of the scratch coat had been well done. While not all the spaces were entirely filled by this method the success was greater than anticipated. Eliminating the types of lath which were unsuited to this construction probably 99 per cent of the total area so treated presents the smooth, unbroken surface of an interior wall, not even showing the pattern of the imbedded lath. It is evident that a diamond mesh lath, or one all of whose strands slope at the same general angle to the plane of the lath as a whole, should be used if the best results are to be obtained by this method.

As already stated no examination has yet been made of the metal actually imbedded in the plaster or stucco, and the condition of these additional samples will not therefore be determined until later. It is anticipated, however, that both these methods, at least so far as the durability of the lath is concerned, will be found to be more satisfactory than the type of application now commonly specified.

\* Published in June, 1912, in THE NATIONAL BUILDER.

# A Bungalow for \$2,750.00

*Jack Manley Rose, in The National Sunday Magazine*

THERE is in all of us at times a tendency to weary of the orderly surroundings of work-a-day life. This feeling is variously explained as a reversion to type, a back-to-nature harking. Our separate conceptions of this idea, of course, depend largely upon our different temperaments, and our accustomed ways of living.

To the person of wealth and ostentation, *roughing it* means a widely divergent thing from camping. Between the spacious lodge of the millionaire, the expression of *his* love for the open, and the 9 by 12 tent with a board floor and doghouse extension that shields the true camper from the elements, ranges a long line of habitations to suit conditions and requirements.

Consequently, the average man of family has come to demand for his vacation days a somewhat more complex and habitable shelter, with the chief demands; simplicity, comfort, air and freedom. Simplicity of detail; of household arrangement and furnishing; comfort in both the sleeping and the waking hours; a clean sweep of air and breezes; and freedom from drudgery. The bungalow pictured on the opposite page will prove to fill all these demands and something more. It is designed primarily for the average family to dwell in for fully seven months of the year; is well adapted to location at the seashore, the mountain lake shore, or the river frontage; its low, pleasing proportions fitting into the landscape, and its wide and generous piazza commanding a good view.

The cost of its construction is well within the means of the man of modest income. Its two bathrooms guarantee comfort of a degree not to be scorned; the kitchen is complete, the bedrooms are adequate to the demands of family life, and the huge living room surely will give that sense of freedom and space that most of us long for. The exterior finish is harmonious and simple; the interior, informal and charming; an ideal setting for

the colorful furnishings so much in vogue for the summer home. The neutral background of boards stained a weather grey, the big fireplace and field stone with its deep embracing settles and broad stone hearth, the open gallery, and the high raftered clear-story all are deeply suggestive of a suitable scheme of decoration at once extremely simple and alluring. Here one would dispense with knick-knacks, with heavy, dusty hangings, costly rugs, and ornate furniture. The casement windows and the wide French doors open to the view and the whole out-of-doors, would demand the simplest curtaining. Light and airy muslin that stirred in the breeze, with possibly a quaint patterned cotton overhanging, in the new wood-block printing. Cotton rugs, or fibre, or beach grass, woven, would be the ideal floor covering; so light as to be easily shaken out, and so selected from the wealth of harmonious tones that the manufacturers are showing, as to blend unobtrusively into the color scheme. Willow and wicker furniture, stained grey or left in the natural straw color, with here and there a substantial table or chest of the Craftsman type, plain in line and dull in finish, and a bright note struck again in the soft, glowing lampshades and the framed prints. The bedrooms would be charming in inexpensive white enamel furnishings of the cottage type; cheerful flower printed cotton spreads and Dutch window valances, giving a decidedly dainty touch. A room in old Colonial blue would be delightful, the rug a circular affair of braided grey and blue rags, blue sunfast material over plain book muslin at the windows, with the white furniture possibly decorated on the chair backs, the bureau fronts, and the bed heads and foot boards, with a tiny nosegay of blue, a quaint style that is having a revival of late.

If you can picture this interior with its feeling of summer airiness and comfort, you will find in the arrangement of the rooms the same keynote preserved.



You enter directly through the heavy Dutch half-door into the large living room. At the right the little gallery stairs turn and go up two steps from a low landing, then across the landing and down again is a little hallway which gives into a comfortable bedroom, a well-equipped bathroom, and beyond, the kitchen. The kitchen has another door leading into the end of the living room where a commodious dresser for the table china backs against one of the settles of the fireplace. This fireplace is the special feature of the room. Its generous proportions and quaint stone hearth, carried out to the end of the settles, give it all the comfortable seclusion of an English inn. Here, on chilly nights, with the dining table pushed in between the settles, the family might well enjoy the cozy nearness of glowing logs. With the kettle steaming on the hob left for that purpose in the stone construction of the opening, and the warming firelight flickering on the glass and china, there is a suggestion of peace and hominess that princes might envy. Out-of-doors it may storm and rage, the sea may be kicking up surges, but within, under the soft-shaded lamps, and beside the log or driftwood fire, the security of a warm and charming shelter predominates.

The upper floor, over half the house, consists of gallery, owner's room, a bathroom, maid's room, and a bunkroom. The bunkroom is fitted up with two built-in bunks, so dear to the heart of growing youth. In this room, under the eaves, is also space enough to store trunks. The owner's room commands the southern and western views and has two closets. The maid's room is compact and airy. All these rooms are open to the rafters, and are thus cooler than if ceiled. As the house is not plastered the well-known method of sealing with wide boards battened at the joints with strips of lattice has been employed. This gives the effect of paneling and admits of a variety of treatments all equally good. The doors may be of a cheap stock pattern, or made on the spot by the carpenter in construction. The interior finish in the living room continues as high as the gallery line, and is there terminated by a plate rail or shelf

running around the three sides of the room. The windows, all of the casement type, particularly suited to the bungalow, or half bungalow, are arranged where possible in groups of two or three, and so situated as to provide the freest circulation of air.

There are ample sleeping accommodations for seven persons, and the large living room with its couches or Gloucester hammocks could easily shelter more in an emergency. A corner of the piazza, screened with canvas or latticed, would make an ideal out-of-doors sleeping room, and here too, the ever desirable couch hammock could play its part again. This same corner, so shielded from the prevailing winds, would form a cozy nook for daytime lounging or meals served out of doors. As the porch is almost flush with the turf, no rail is necessary or even desirable. The living room serves also for a dining room, at the end near the kitchen door. Here are groups of casement and long French windows that open out on the piazza. The kitchen arrangements are compact and convenient, especially planned to save steps. The kitchen porch is latticed, and has space for the icebox. a cool pantry opening from the kitchen also is built out here, and incorporated at the sides of the porch are coal and rubbish boxes with hinged lids. The sink and work table are well placed to get air and light, and the tops of the set tubs next to the sink furnish, when not in use, extra table space.

The living room is furnished with a hanging closet under the gallery stairs, and the settles each side of the fireplace make adequate woodboxes. The dresser is constructed with three drawers, ample shelves, and a lower cupboard. The first floor bedroom has a roomy closet, and the bathroom is well provided with shelf space.

In the gallery a locker under the window at the head of the stairs could be used for the storing of linen, and all the bedrooms on this floor are well equipped with hanging room.

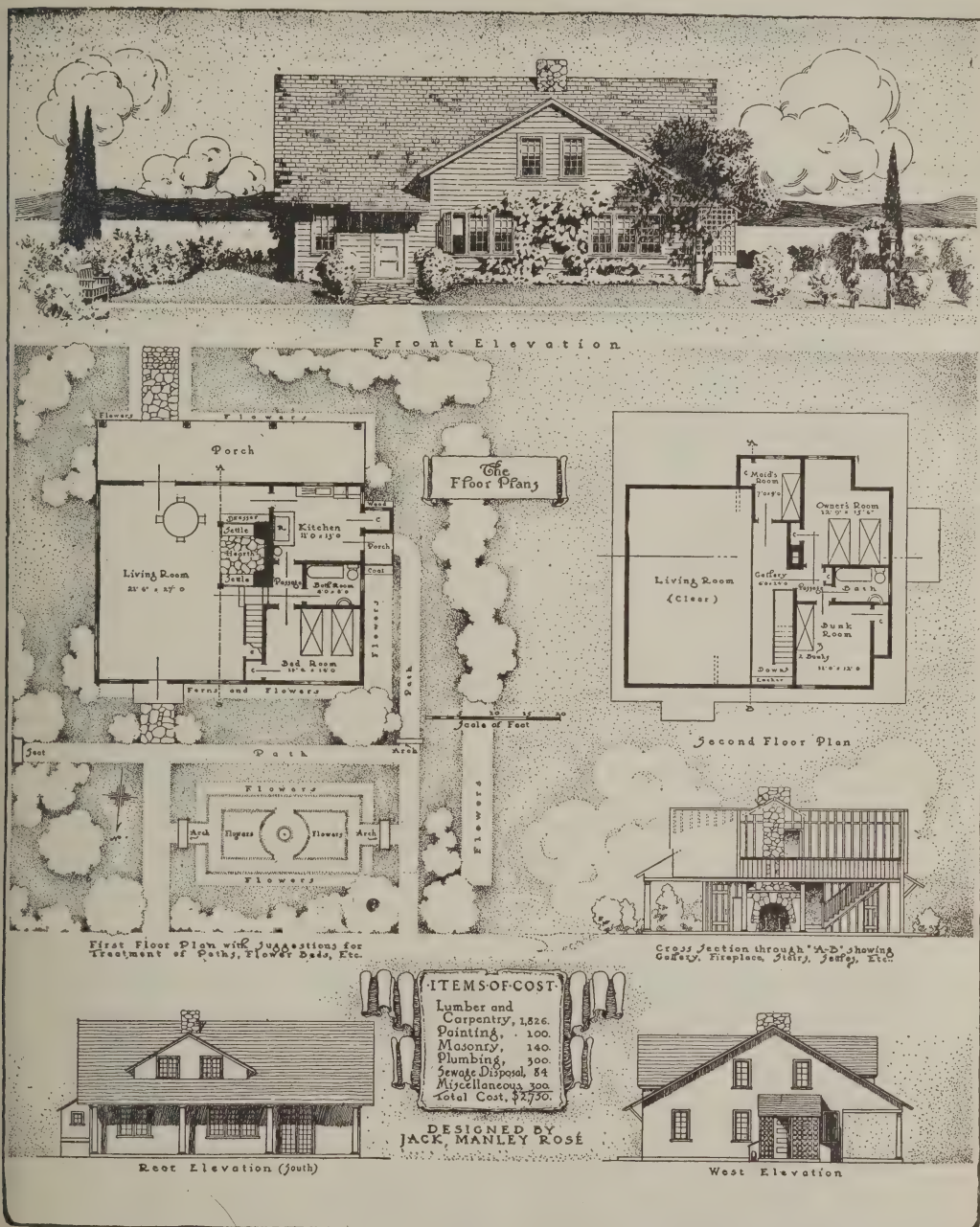
There are no thresholds except at the outside doors. The stairs are so arranged that one may pass up or down them from the bedrooms or service quarters without

being unduly in evidence from the living room.

Low built-in shelves near the entrance

the left side of the living room as you enter the front door.

The plumbing is grouped, for economy's



door will hold innumerable books and excellent storing space may be obtained by constructing a locker bench with long shallow drawers, under the windows on

sake, in one section of the house, and the fixtures, though of the best make, are the simplest and least expensive patterns obtainable. A septic tank will take



care of the sewage and an appropriation of \$84.00 has been set aside towards this end. The water supply must of course depend upon location, and, if town or city water is not available, there are several well-known and good methods of securing a water system.

As for the exterior, special attention has been paid to the matter of low lines and homelike appearance. The outside wells are of first quality siding, stained like the interior a weather grey, with a wood preservative. Cream white paint is used on the trim, about the windows, on the window sash and the porch posts. The oaken Dutch door is stained, shellacked and rubbed down to a dark grey color. White lead used as a filler, rubbed in and out of the grain before the dark stain is applied will give a pleasing effect. The roof shingles are left to weather. In a setting of green shrubbery, vines and a bit of a garden, this little house will soon acquire a charming atmosphere of its own, and if placed close to the sea, or on the border of a lake or the edge of a river, will prove to be a true vacation bungalow.

Nowadays one hardly ever thinks of a house without its setting. The making of a garden spot about a house has become quite as important as the building of the house itself. If one is occupying this out-of-town house for seven months of the year, or even five or six, wonders may be accomplished annually, and the bungalow may have a verdant and blossomy setting that in itself may well have a delight and a fascination. If beach grass grows to the very door, do not be discouraged; what is lovelier than the waving grey-green of this tall supple sand covering? Pale creamy sand dunes topped with this wind-bent growth, makes

an excellent foundation for the landscape scheme. Great patches of the creeping dusty miller that takes the color of the sand shoals in sunlight, can be cultivated. The addition of a slight top soil about the house proper on the slope back from the sea will give foothold to many hardy plants and shrubs. Dark dwarf cedars of queer Japanesque growth love the sea and the sandy soil. Feathery asparagus, which, in its early stage has more to recommend it than the mere beauty of its later development, will grow almost on the very beach itself. Nor think that you can't have trees, sturdy specimens of many varieties will furnish shade if planted slightly in the lee of a dune or gentle slope. It is the remorseless winter sea winds that chiefly keep our exposed sandy coast untimbered. Once a bit of growth is established, be it only scrub oak and beach plum, such growth in turn will furnish sufficient shelter for any number of your favorites.

This particular bungalow, fully equipped, will cost not over \$2,750.00. In many localities it may be built for less. The labor is first class, and the lumber is of best quality of the kinds obtainable. The painting item covers stains, paint, floor finish and labor. The masonry figure is for chimney, fireplace and hollow tile piers. The plumbing covers all fixtures and installation of the same. A generous allowance has been made for a cesspool and piping.

This house could be made habitable for the entire year by excavating a cellar under a portion of it and installing a heating plant. Mineral wool packed between the studding and complete inside ceiling of battened boards would make the little house fully as warm as the average winter dwelling, at small cost.

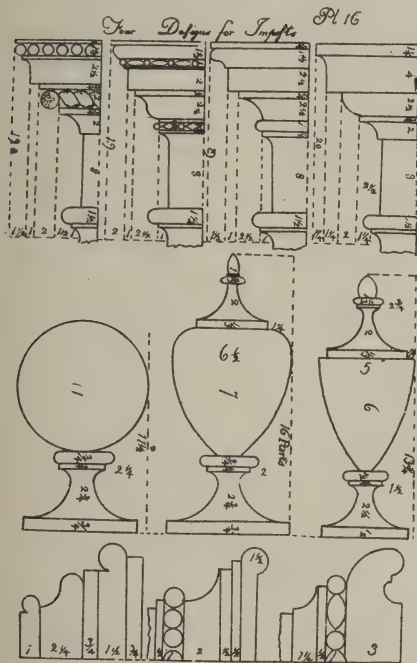


# Architectural Drawing Lessons

## Twenty-First Paper

WE have already shown examples of some of the orders, also various proportions, of their several parts. In the illustrations, Figures 143 and 144,

items, and will teach the student not only to draw, but also instruct him as to the proper proportions of the various parts of these orders, a knowledge of which is quite essential to any ambitious workman who is desirous of becoming a master mechanic. We would enforce on all those who are "following" these lessons to repeat these drawings as often as possible in order to familiarize themselves with the terms, the dimensions, and the forms of the various orders, and parts thereof. Besides, the drawings make excellent exercises, and the frequent exercises in their making will make the amateur draftsman quite expert with his drawing, and enable him to do his work quickly and neatly. There is nothing gives character to a drawing more than neatness, correctness and well defined lines. In Figures 145 and 146 we show the same columns striped of ornamentation but showing the manner in which the entasis of the shaft is obtained. The student will notice that on each column the outside line is slightly curved. This curve is called the entasis, and, if this was omitted, the column when in place, would look hollow and smaller in the center of its length. This curious optical illusion is provided against by the adoption of the entasis. It would take up more space than we care to employ, to explain the why of this illusion and it really belongs to the science



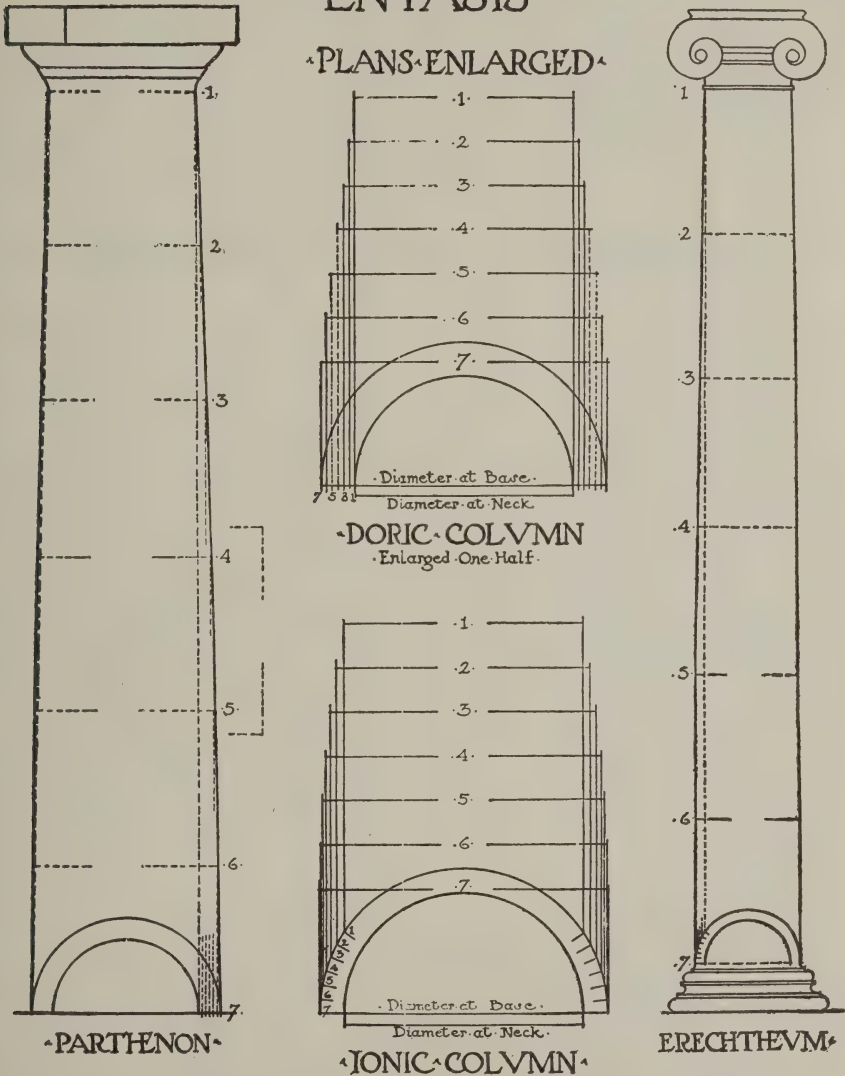




in every particular. The mouldings and turned work shown in Figure 147 are measured examples of Greek work and may be redrawn to a larger scale. These

It may not be out of place at this point to call to the attention of a young draftsman that there is a very large field outside of architectural drawing, in which his abil-

A METHOD OF DETERMINING THE ENTASIS



OF GREEK DORIC & IONIC SHAFTS

Figure 145.

Figure 146.

ornaments are much used in colonial work and are much in vogue at the present time in the interior of colonial and classic buildings.

ities and skill may find room for profitable and pleasant activity. A few hints on this point may prove of value. There is always a value in illustrating, with pen and



ink, of noted events and places and a good free-hand draftsman can always find a market for his productions, if they are good and timely.

The most common fault of the beginner and one that should be carefully avoided is in making his drawings too small. He attempts to imitate the work of the printer and engraver, rather than the work of the artist. We mean by this that he tries to make his drawing have the same "fine" effect as the engraver prints, not realizing that the real object may have been from four to ten times larger than the engraving from which the prints were made.

(To be continued.)

## A Sleeping Porch Window

*By Chas. Cloukey*

THE rather recent turn in American architecture, based on the theory that too much fresh air is just enough, has brought a demand for a sleeping porch window, which will at once be weatherproof and capable of being stowed away out of sight and room when one wants only the screens in the openings.

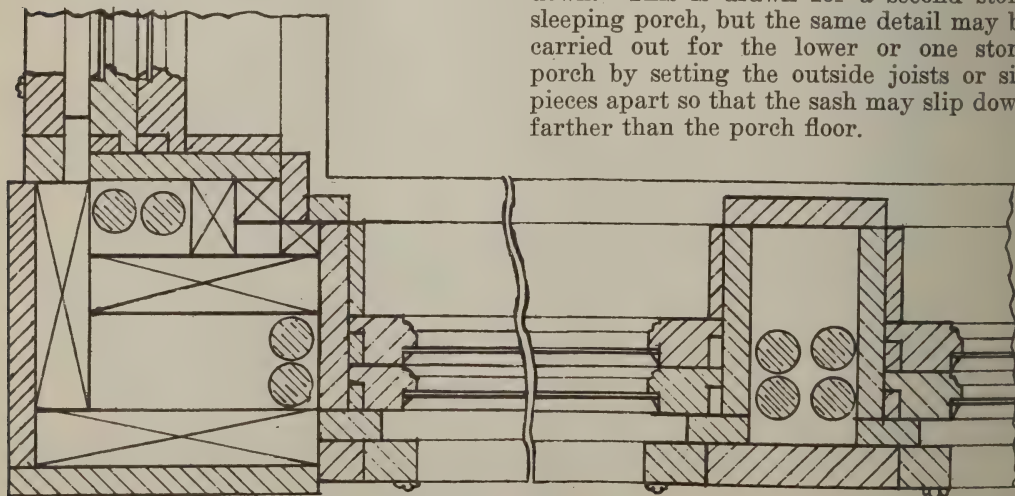
The above is especially true of small porches where all of the room is needed on the inside, and where the beds must sit close to the windows, necessitating a very flexible method of ventilation for cold or winter weather.

It is also desirable that the windows may

be readily closed in case of storms, and also in cases of slow or vertical rains that the window be partly closed, leaving the ventilation either at the top or bottom as the case may demand.

A careful study of the accompanying drawings will show a window frame construction which is at once simple and covers the desirable points in question.

It will be seen that the framework of the porch between the top of the rail, or in other words, the sill of the windows, and the chord of the porch below, is made of 2x4 studding set edgewise with enough space between for both sash to slide up and down. This is drawn for a second story sleeping porch, but the same detail may be carried out for the lower or one story porch by setting the outside joists or sill pieces apart so that the sash may slip down farther than the porch floor.



Plan of Frame.

It appears at once that the pocket below in any case must be at least one-half the height of the window or really a little more than half so that both sash will go down and let the hinged sill turn down to place.

The hinged sill in the drawing is shown in its open position by the dotted lines.

Either one or both sash may be put down and the sill turned over to its place, making the opening practically water tight. When the sash are down and the sill turned in to place there will be the two half-inch openings on each side which will not be covered, but it would be unlikely that much water would find its way through so small an opening. However, it would be an easy matter to provide a drain at the bottom for any water thus trapped to escape. In case of a one story porch the bottom could be left open.

In the mullion shown there is ample room to put a 2x4 stud in front of the weight space if it seems desirable to add to the support of the superstructure. Generally speaking, the several members of the mullion itself would be sufficient to support all the weight of a porch roof.

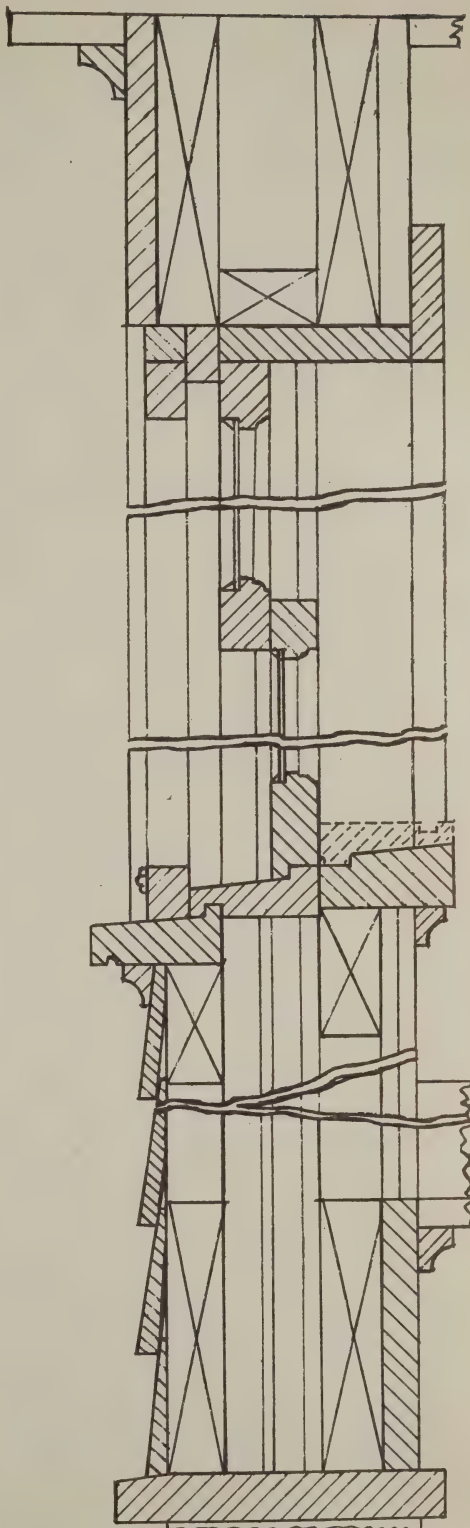
One of the important features of the porch construction is the layout for the corner so as to get in the largest possible window without interfering with the proper operation of the different parts. The figure shows how this is done so as to leave about half an inch to spare when the two sills are thrown back to the inside as they have to be when the windows are shut.

The screens may be hung at the top or at the sides as desired, or they may be fastened in stationary, as they will in no way interfere with the operation of the windows.

It will be seen that it is not practical to use a check-rail window on account of leaving too much opening at the sides when the sills are turned under the windows as in the case of the upper sash.

There is one improvement we have to suggest for the sash as shown in the drawing, and that is to have the tongue at the side in the middle of the stile instead of the edge, thus giving a place for the cord to rest out of the way of the hinged sill and also to make less room for the rain to blow in.

We can see no good reason why this idea may not be applied to any window



Section of Frame.



frame for bed rooms or any other part of a building where it is desirable to have all the air space the window opening will allow.

We have slip head frames in all kinds of walls, and if we can get a practical and weatherproof sill there is no reason why our windows may not all be put out of sight at the bottom if we can make the necessary arrangements in the wall space.

We might arrange to slip one sash up into a pocket at the head and the other into a pocket in the sill, and still preserve the normal thickness of our walls.

But someone says that we would have to fight the housekeepers on account of the curtains and draperies and no doubt that someone would be right; so perhaps we had better let it go for the sleeping porch alone, at least until the other becomes the latest idea in windows.

## Some Notes on the Steel Square

Figure 16 exhibits the operation of finding the angles to form and mitre a seven sided polygon by the use of the square.

Place the square on the line  $AB$ , with  $14\frac{1}{2}$  inches on the blade, and 7 inches on the tongue; mark from the latter and the line for the mitre, then place the square on the opposite side of the line, and mark

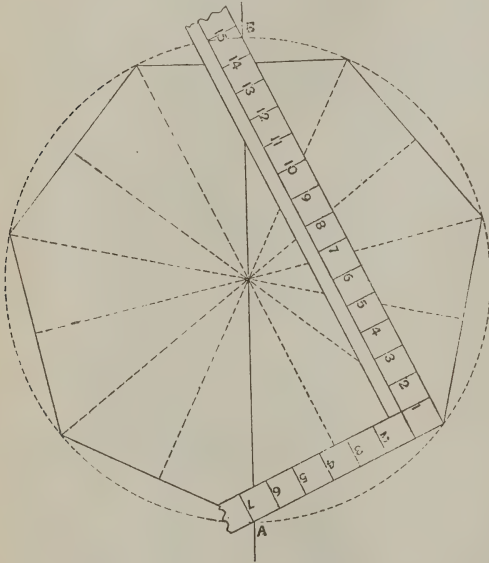


Figure 16.

for the angle to form the polygon required.

To find the area of the polygon, multiply the side by half the altitude of the triangle, the product by 7, the number of sides, for the area required.

Figure 17 exhibits the operation of finding the angle to mitre an eight sided polygon, by the use of the square.

To find the angle to cut the mitre,  $180^\circ - 45^\circ = 135^\circ \div 2 = 67^\circ 30' =$  the angle

A. To find the angle place the blade of the square on the line  $AB$ ,  $90^\circ - 67^\circ 30' = 22^\circ 30'$ , the angle required.

Place the square on the side  $AB$ , with 7 inches on the tongue, and  $16\frac{7}{8}$  inches on the blade; mark from the tongue. Again,

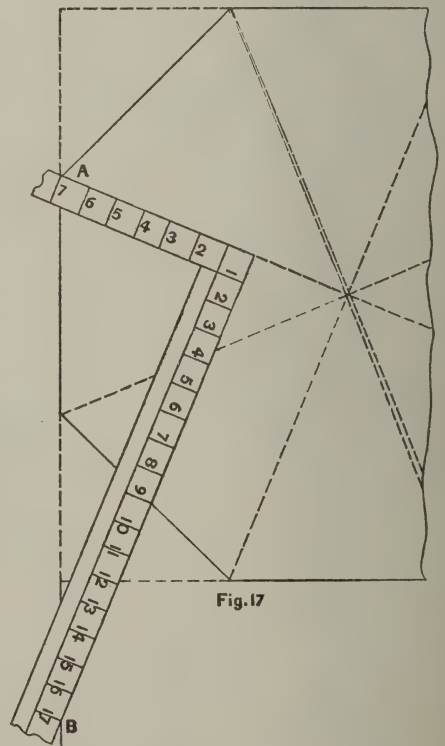


Fig. 17

place the square on the side  $AB$ , with  $7\frac{1}{2}$  inches on the tongue, and  $18\frac{1}{8}$  inches on the blade; mark from the tongue. These rules are approximations, but near enough for all practical purposes.

The problem of finding the angle  $22^\circ 30'$

can only be solved by the use of the protractor and square, or by bisecting the angle of 45 and squaring from the bisected point.

To find the area of the polygon, multiply

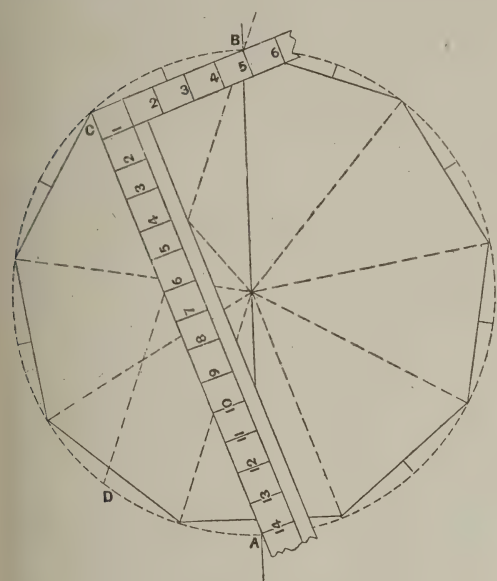


Figure 18.

the side by 8, the number of sides, the product by half the altitude of the isoseles triangle, formed by the side and diagonals.

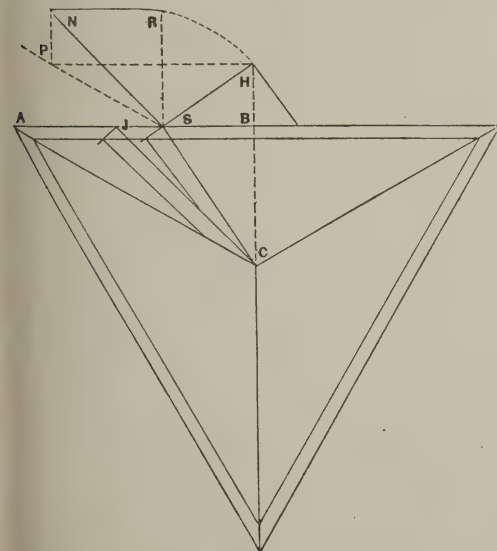


Figure 19.

Figure 18 exhibits the operation of finding the angles to form and mitre a polygon of 9 sides, by the use of the square.

Place the square on the line AB, with 14 inches on the blade and 5 inches on the tongue; mark from the tongue for the side of the polygon, and from the line for the mitre.

To draw the polygon with the square: From the point A as center, with CB as radius, describe an arc, cutting the circle at D, draw DB; place the heel of the square on the point B with the blade on the point D; mark from the tongue for the side and length. The same operation continued will complete the polygon required.

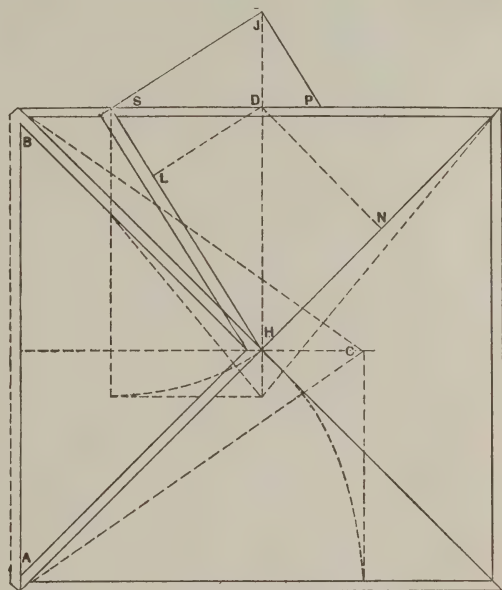


Figure 20.

Figure 19 exhibits the plan of a three sided hopper.

To find the angles to cut the sides and mitre the edges when the run and rise are equal. Place the square on the edge and sides, with AB on the blade, and JC on the tongue; mark from the blade for the cuts required. Or place the square on the edge and side, with 16 inches on the blade, and 13 inches on the tongue; mark from the blade to mitre the edges and cut the sides.

To find the angles to cut the sides and mitre the edges where the run and rise are unequal. Draw CS the angle of elevation, SP parallel to CA, and SH at right angles to SC; from the point S as center, describe the arc HR; tangent to the arc draw RN, join SN. Then ASN equals the angle to



cut the mitre, and  $BSH$  equals the angle to cut the sides.

By the use of the square. Place the square on the edge, with  $RN$  on the blade, and  $RS$  on the tongue, mark from the blade for the line to cut the mitre; place the square on the side, with  $BS$  on the blade, and  $BH$  on the tongue, mark from the blade for the line required. If the rise of the side is greater than the run apply the angle for the mitre to the side, and *vice versa*.

Figure 20 exhibits the plan for a square hopper.

To find the angle to cut the sides and mitre the edges, and also to cut the edges for butt joints, where the run and rise of the sides are equal. Place the square on sides and edges, with 10 inches on the

mitre the edges when the run and rise of the side are equal. Place the square on the side and edge, with  $11\frac{3}{4}$  inches on the

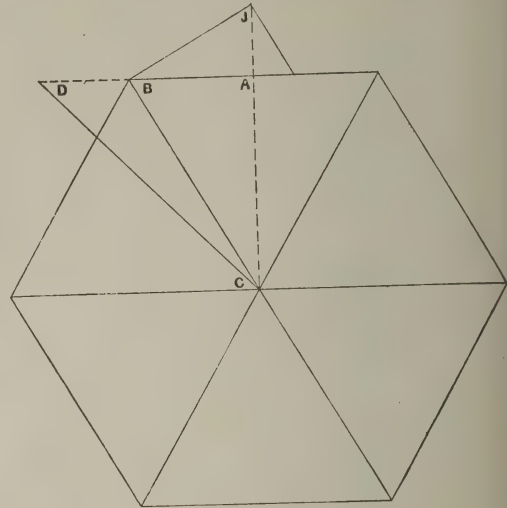


Figure 22.

blade and 6 inches on the tongue; mark from the tongue for the cuts required.

To find the angle to cut the edge for a butt joint. Place the square on the edge, with  $9\frac{1}{2}$  inches on the blade, and 8 inches

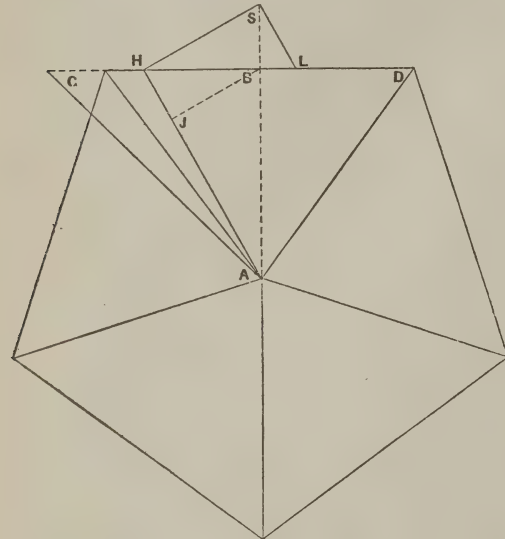


Figure 21.

blade, and  $7\frac{1}{8}$  inches on the tongue; mark from the latter for the cuts required.

To find the angles to cut the sides and mitre the edges where the run is greater than the rise. Draw  $HS$  the angle of elevation,  $SJ$  at right angles to  $SH$ , and  $JP$  at right angles to  $SJ$ ; place the square on the side, with  $DS$  on the blade and  $DL$  on the tongue; mark from the latter for the cut required. Place the square on the edge, with  $PS$  on the blade and  $PJ$  on the tongue; mark from the latter for the line to cut the mitre.

Figure 21 exhibits the plan for a five sided hopper.

To find the angles to cut the sides and

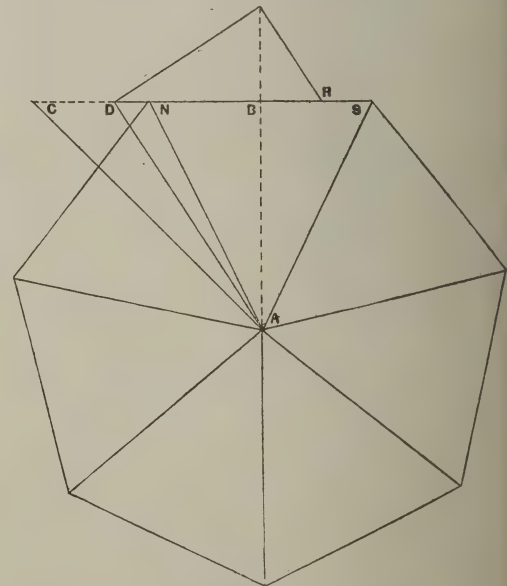


Figure 23.

on the tongue; mark from the tongue for the cut required.

To find the angles to cut the sides and

mitre the edges when the run and rise of the sides are unequal. Place the square on the side, with  $LH$  on the blade, and  $LS$  on the tongue; mark from the tongue for the cut required.

To find the angle to cut the mitre. Place the square on the edge, with  $AJ$  on the blade, and  $BS$  on the tongue; mark from the tongue for the angle required.

Figure 22 exhibits the plan for a six sided hopper.

To find the angles to cut the sides and mitre the edges when the rise and run are equal. Place the square on the side and edge, with  $14\frac{1}{2}$  inches on the blade and 6 inches on the tongue; mark from the tongue for the cuts required.

By the use of the square. Place the square on the sides and edges, with  $CD$  on the blade, and  $AB$  on the tongue; mark from the tongue for cuts required.

To find the angles to cut the sides and mitre the edges when the run and rise are unequal. Draw  $CB$ , the angle of elevation, and  $BJ$  at right angles to  $BC$ . Place

the square on the side, with  $CB$  on the blade and  $AB$  on the tongue; mark from the tongue. Place the square on the edge, with  $CB$  on the blade and  $AJ$  on the tongue; mark from the tongue for the cut required.

Figure 23 exhibits the plan for a seven sided hopper.

To find the angles to cut the sides and mitre the edges when the run and rise of the sides are equal. Place the square on the side and edge, with 20 inches on the blade and  $7\frac{3}{8}$  inches on the tongue; mark from the tongue for the cuts required. Or, place the square on the side and edge, with  $AC$  on the blade and  $BN$  on the tongue; mark from the tongue for the cuts required.

To find the angles to cut the side and mitre the edge when the run and rise of the sides are unequal. Draw  $AD$ , the angle of elevation; place the square on the side, with  $AD$  on the tongue; mark from the tongue. Place the square on the edge, with  $NS$  on the blade and  $BR$  on the tongue; mark from the tongue for cuts required.

# The Covering Capacity of Paint

*A. Ashmun Kelly*

THE mixed paint makers give the covering capacity of their paints at a certain figure, but it must be apparent to any who have to do with applying paint that no set rule can be laid down as to the amount of paint that will be required unless the particular job is in hand. There are various conditions of surface, and paints may be thick or thin, all of which will affect the result. Careful tests have been made to ascertain the exact covering power of certain commonly used paints, and these experiments have practical value. For instance, it has been demonstrated that a good lead and oil paint, one stiff enough not to run when applied to a hard, non-porous, vertical surface, and yet fluid enough to spread easily under the brush, will cover 650 square feet of such a surface. We use the gallon as the unit. Certainly a gallon of such a paint will not cover more than that amount of surface, though some claim more for their paints. A paint made entirely of lampblack and oil will carry more oil than any other pigment,

yet a gallon of this will not cover more than 1000 square feet of surface. The rule is, the thinner the paint the more surface it will cover. But some argue that a paint composed mostly of oil, but containing some white lead, will cover more surface than the oil alone. This is of course nonsense, as the pigment has no spreading capacity at all. In fact, for every pound of pigment added we must extract a certain amount of spreading capacity.

I have used the term covering capacity, when the right term would more correctly be spreading capacity, for we are not discussing the power of a paint to cover the surface, or hiding it, but of the power of the paint to spread, for many think a paint that will spread farthest is the most economical, and it may or may not be, for that would of course depend upon the quality of the paint. A gallon of raw linseed oil will cover or spread over 350 square feet of an absorbent surface, like dry soft wood; it will spread over 650 square feet of hard wood or non-absorbent surface, or 1200



square feet of steel, clean and in good condition. We have seen paints advertised to cover a thousand square feet of surface, condition of same not stated, and if it did, then the coating must have averaged about 1-576 inch thick, a thickness comparable to very fine tissue paper. But there are careless painters, those who do not rub out the paint to a uniform coating, and in this case surely the paint would not go so far. A legal standard United States gallon contains 231 cubic inches, and when a gallon of paint is spread over a surface containing 231 square feet the coating will average 1-144 inch thick. So too, if the paint is made to cover twice that amount of surface the coat would be just half the thickness of the first case, or about the thickness of rather thin paper.

There are cases where a thin paint, well brushed out, will give better service than a heavier coating, but this is not the rule in house painting. Here there is a limit of spreading out beyond which there will be a loss of wearing power. Ordinarily, a paint that does not go beyond 800 square feet to the gallon is the most desirable. It contains the proper amount of pigment. There is a wide discussion on this point of pigment, one side claiming that the more oil and less pigment the more durable the paint; the other side taking the opposite view. Truly oil alone does not make paint, any more than lead or zinc alone makes a paint; it takes the two to form the perfect paint. On the other hand, it is this union that causes the deterioration of the paint, by chemical action. Yet the pigment holds and helps the oil against all adverse influences, while the oil holds and shields the pigment.

Linseed oil is the spreading agent in the paint, and if we find two paints mixed in the usual way, but with different brands of pure lead, we may find a difference in their covering or rather their spreading power. We know from experience how some leads

will take more oil, or maybe less oil, than a certain other brand. This fact is due to the difference in corrosion, the best corroded lead being the finest, and hence taking up the most oil per pound. Hence there may be a rather wide difference in the spreading of two lead and oil paints. Lampblack spreads wonderfully well only because it exists in such fine division. The finer the white lead is made and ground the farther it will spread, and cover as well. Zinc white is a very fine pigment, and hence is a great absorber of oil, ten gallons to the 100 pounds of zinc, while the same quantity of white lead will take up only six gallons of oil. The former will cover 550 square yards, the latter 800 square yards. Dry lampblack will take up the enormous quantity of 20 gallons of oil, and spread over 1000 square feet of surface.

In a general way it may be estimated for ordinary house or structural painting that a gallon of ordinary good lead and oil paint will cover 600 square feet. This is for coating over the priming coat, or over a good old surface. Red lead paint, on structural steel work, will cover from 500 to 700 square feet, according to conditions. Mixed oil paint, on iron work, will cover about 600 square feet. Ochre priming will cover about 400 square feet. Mixed paint on plaster will cover about 400 square feet. Interior oil paint, over oil paint surface, will cover about 800 square feet. Over flat paint, about 700 square feet. White lead priming paint, about 500 square feet. The same on priming plaster.

A coat of paint is of course a variable quantity; it may vary from 1-5000 inch to 1-1000 inch in thickness. As previously stated, the thickness will depend upon the paint and the man behind the brush. A thin coat is apt to prove the more durable, all else being equal. Heavy coats of paint are very seldom advisable.

# OUR READERS PAGES



[The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessarily for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experience will be given proper space.—Ed.]

## Answers

CLEANING EXTERIOR BRICK WORK.  
From "L. E. N.," Indiana, in reply to "N. F. A.":

Regarding cleaning exterior brick work, etc. This is done with diluted muriatic acid. The acid is simply mixed with water in a wooden pail and the brick work scrubbed with a fibre brush until it is clean and then rinsed off with plenty of clean water.

SECTIONS OF DRAWINGS  
From "The Editor":  
In the articles on drawing now being

the mind of the student that he can read them just as easily as he can the alphabet. To a workman engaged in any branch of building construction, although the information in his own branch may not contain more than he already knows, the other branches will be interesting and instructive, because every workman has the possibility before him of becoming a general foreman or a clerk of work. In such a position it is essential that he should be familiar with the principles and practice appertaining to the other trades. Then again, every one lives



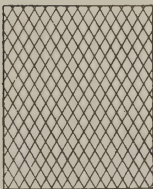
WROT IRON.



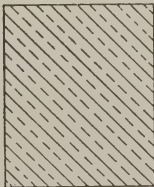
CAST IRON.



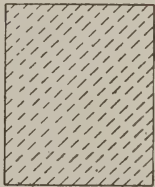
WOOD.



LEAD.



BRASS & BRICKWORK.



STEEL & STONE.

Pencil or Ink Section lines for various materials.

published in THE NATIONAL BUILDER, the editors have shown some sections of various materials, and how to construct them so that the material to be used where designated may be known from the drawings. The six examples exhibited here should be drawn and redrawn, and so impressed on

in a house of some sort, and many tenants look forward to the time when they will be able to buy or build their own house, and having obtained a general knowledge of construction, will begin to draw out plans which they hope some day to realize in brick and mortar. A thing that is worth



doing at all is worth doing well. What may be mere pastime at present may become necessary as a means of earning a living at some future day, and time spent in acquiring useful knowledge can never be wholly wasted.

#### REPAIRING A CHIMNEY.

From "L. N.," Ill., answering "J. L.," New York:

The best way to fix up your chimney is to put in a sheet iron pipe, the largest convenient size, possibly an 8" round pipe, fitting it complete from top to bottom and then pouring in a thin grout of cement to fill the corners between the pipe and chimney.

If this grout is made thin enough it will fill the joints perfectly and the pipe itself will protect the brick work for a long time. If it ever should rust out, the cement will by that time be hard enough to prevent any danger from fire.

#### CONCRETE PILES.

From "L. R. F.," Phila., in reply to "Contractor," Milwaukee:

Concrete piles are made in all of the large cities in the United States and, so far as I know, there is no Building Law which does not permit of this type of construction. As a matter of fact concrete piles, as a rule, are favored and are given a higher permissible loading than wooden piles.

Concrete piles possess many advantages over those of wood. There is no possibility of rotting of the concrete, and it is not subject to the attack of insects. Wooden piles must be cut off at the low water mark if they are to last any length of time. In order to do this it is necessary in many instances to excavate to a considerable depth. This, many times, entails a large cost as the ground is usually soft if the foundation requires piling at all. This means that a considerable amount of shoring and often pumping has to be done. With concrete the pile can be brought up to the ground line.

Concrete piles are of two general types:

*First*—Those molded in place, that is, poured in the position they are desired to occupy.

*Second*—Pre-cast piles. That is, piles made and seasoned, later being jetted and driven into position.

Of the first type those best known are:

The Raymond Concrete Pile, manufactured by The Raymond Concrete Pile Co., 140 Cedar St., New York.

The Simplex Concrete Pile, manufactured by Simplex Concrete Piling Co., 3400 Disston St., Tacony, Philadelphia, Pa.

The MacArthur Concrete Pile, manufactured by The MacArthur Concrete Pile & Foundation Co., 11 Pine St., New York.

Of the latter type those best known are: The Gilbreth Concrete Pile, manufactured by Gilbreth Concrete Pile Co., 60 Broadway, New York.

Chenoweth Concrete Pile, manufactured by A. C. Chenoweth, 177 Montague St., Brooklyn, N. Y.

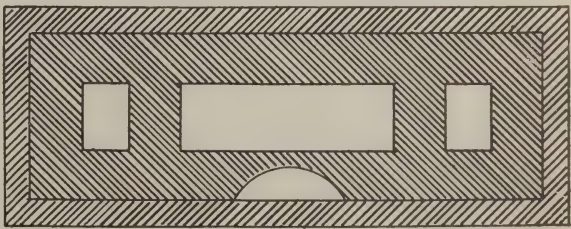
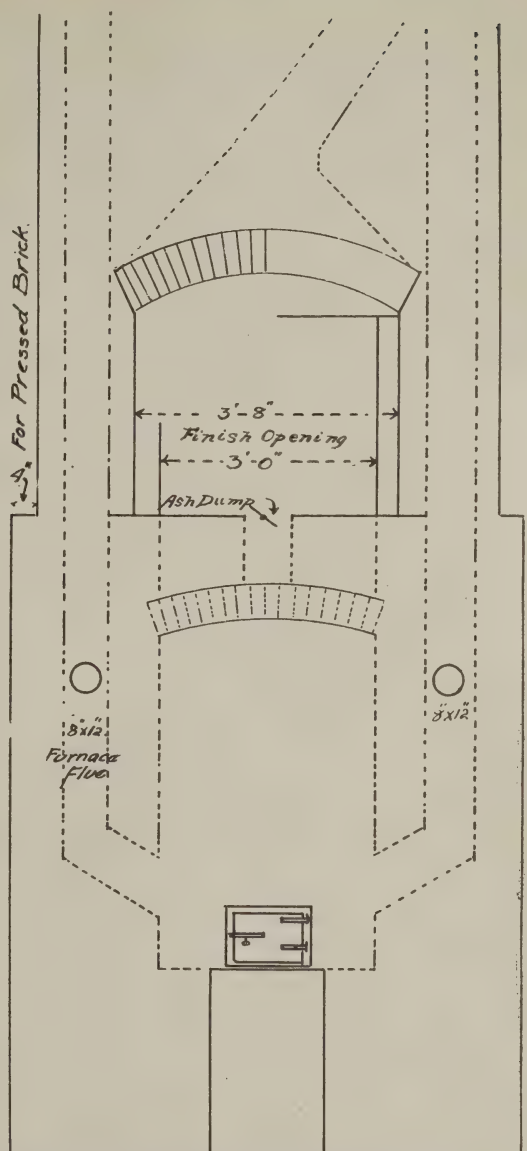
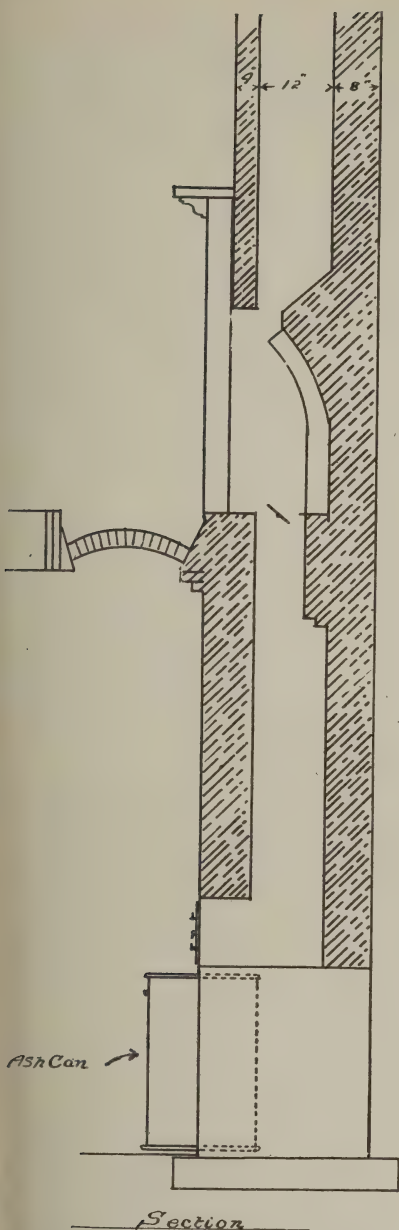
The Concrete Pile, manufactured by The Hennebique Construction Co., 1120 Broadway, New York.

By addressing any of these Companies detailed information can be obtained which will give you the data desired.

#### BRICK MANTEL AND HEARTH

From "W. G. R.," in answer to "Bricklayer," Kenosha:

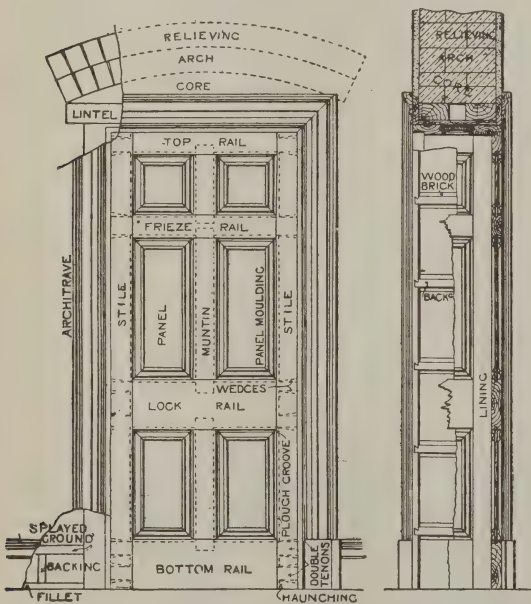
Assuming that the fireplace is on the first floor, an ash pit is formed in conjunction with it in the cellar, so that the ashes from the grate may be readily discharged into it, and from which they can be removed at regular intervals. The size of the foundation depends upon the size of brick mantel required, if there are any flues to be carried up from the cellar, (furnace or laundry flues) and if there are to be other fireplaces above the first floor. Assuming the opening in brick mantel to be 3'-0" clear, then the opening in the rough brick work should be 3'-8". Allowing for a flue 8"x12" each side of the mantel, and also a projection of 4" each side for the pressed brick, the width of the base will be 7'-12". The footings should project 4" beyond this. If there are no flues from the basement, the jambs may be reduced 4" each. If the room in which the mantel is to be built is not very large, then the finished opening in the mantel may be reduced to 30". The height of the opening is governed by the width, about 30" to 36" for large mantels. The depth of the niche should never be less than 12", this will give 8" for flue. The by-laws of many cities require the outside wall behind all fireplaces to be not less than 8"



Brick Mantel and Hearth.



thick, while in other cities 4" is all that is required. The construction of the flue is very important, and great care should be taken in forming it. The flue should be drawn to the center, or to one side if there is a fireplace above, the divergence should be gradual, and is best affected by the introduction of curves of large radii, thereby reducing the friction in the flues. The friction is considerable when sharp angular offsets are formed. Curved flues are considered preferable to those that are perfectly straight in that they prevent rain and sleet from falling vertically on the fire, while they also tend to check down drafts. The opening above the fireplace is contracted like an inverted funnel, or hopper, so as to guide the ascending current of heated air and smoke toward the inlet to the flue proper. The funnel shaped contraction, called the "throat" is formed by drawing over the brickwork, each course of brick adjacent to the opening being corbeled, the lower corners of the brick are cut off with the trowel, and the corbeling follows a curved outline up to the neck, or inlet, of the flue proper.



Elevation and Section of Six Panel Door and Frame.

#### DOORS, FRAMES, AND FITTINGS.

From an "Old Hand," Detroit, Mich.:

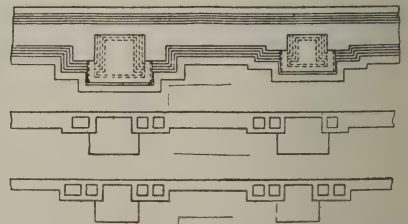
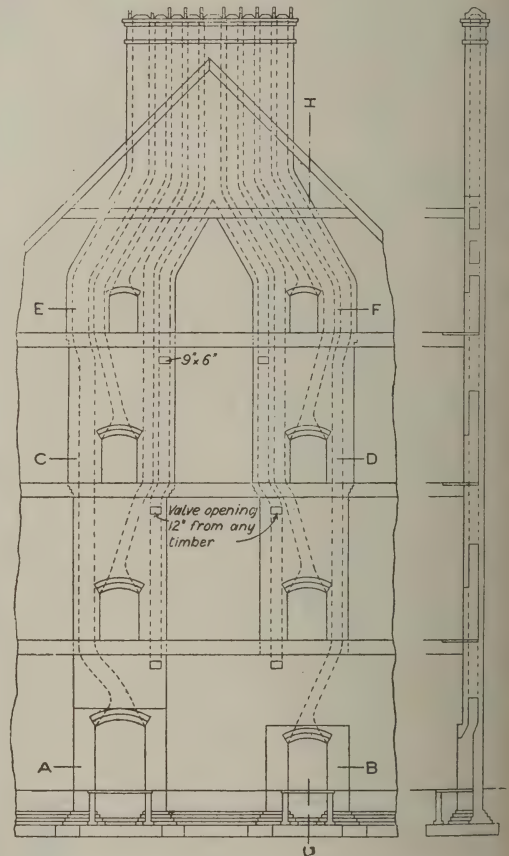
If "Workman," will closely examine the drawing I send you herewith, he will understand exactly how to frame, trim, build in

and completely finish a panel door in a brick wall in first class style. The elevation shows the door, and how made. The frame and trimmings, blocks, lintels or trimmer, mouldings, and relieving work, linings or paneling and section of door, lintel and brick work.

#### CHIMNEY AND FIRE-PLACE BUILDING.

From "Another Bricklayer," Detroit, Mich.:

The enclosed illustration and details, will give "Bricklayer" a good idea how to



Elevation and Plans of Chimney Flues and Fire-Places for Eight Room House.

group a stack of flues through one shaft. There are lots of chimneys in this city built in this manner, and there is never any trouble arising from them if the work is done well and the interiors of the flues nicely and smoothly parged. The parging of the

flue, has much to do with draft of a flue, and if the inside is nice and smooth, the current of smoke will not meet with obstructions, but will pass upwards in a direct current. The curves and turn in a flue, if they are gradual and smooth will pass on the smoke and air without interruption.

## Questions

### OBTAINING AN ARCHITECT'S LICENSE.

From J. H. J., Chicago:

I wish to become a licensed architect and would appreciate very much if some reader of the NATIONAL BUILDER would kindly inform me what qualifications are necessary to secure a license. In what manner and where can I obtain one?

### CEMENT BRICK FOR FIRE PLACES.

From "S. T. R.," Trenton, N. J.:

Will some one kindly advise me what is known of Cement Brick to take the place of Fire Brick? From an authoritative standpoint, can they be made to stand the test, and what is the formula?

### VENTILATING A SHOW WINDOW.

From "C. O. M.," Ill.:

Will some one kindly let me know how to ventilate display windows so they will not get sweaty or frosty? I have tried a 10"x 12" register, also 1/2"x3" slots so as to make air circulate parallel with the glass.

### DRYING LUMBER.

From "H. L. B.," East Earl, Pa.:

Can you give me any information in regard to drying lumber. I am building a house and have the lumber, but not dry for finish. I have about 18 miles to the nearest kiln. Could I not dry same satisfactorily either with steam or stove? I have a 30 H. P. boiler, but no kiln. Would the stove do the work?

### BOXED SHUTTERS.

From "Young Workman," N. Y.:

I have a number of windows to finish in the old style, of boxed shutters, and having never done that kind of work, I wish I could get some person who has had experience make me a sketch and publish it, in

the NATIONAL BUILDER. It might prove useful to many other readers. I just wish for a plan of the window showing section of sash and shutters, and the general layout of the work. It is a brick house with twelve inch walls, stone sills and back plastered walls. I will feel obliged for any information.

### JOINTS.

From "Young-Un," Erie, Pa.:

Will some reader kindly show by drawings how to form joints on boards, so as to make right angled work.

### CIRCLE ON CIRCLE.

An Amateur Workman, Winnipeg:

I have taken the NATIONAL BUILDER for a number of years, and could not now well do without it. To me it is as necessary as my Sunday dinner. Could any reader tell me what is meant by "Circle on Circle"? This is an old country phrase, and is used among old countrymen here quite often. I would like to know what it means, also be able to work it out.

### COLORING CEMENT

From "Plasterer," Ohio:

Will some reader who knows, kindly inform me what sort of paints or stains to use, to make a desirable color in cement? I would like several "colors" if not asking too much.

### DOUBLE BAY WINDOW.

From "Puzzled," Pa.:

I want a design for a two-story bay window semi octagon plan, with a pointed roof, which is to finish against the south end of my house. Will you kindly publish one and oblige?



# An Oak Hall Tree

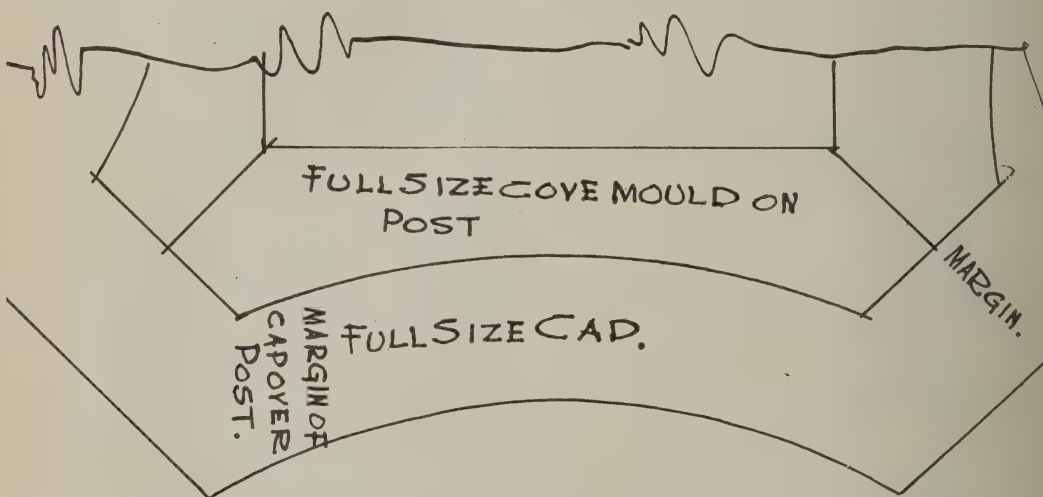
*Hugh H. Chambers*

THE following is a description of an oak hall tree which is very easily and inexpensively made. One great advantage found in a tree of this style is that it stands close against the wall. It is inexpensive yet a very pretty piece of furniture. It is 5 feet 6 inches high, with three large hooks on top and 3 feet on the bottom. Contrary to appearance it is impossible to upset it by having weight on the hooks.

The post or part marked B on detail is made of 4" cove mould glued and nailed together to form three sides. (The back is left open.) After putting this together,

rial,  $11\frac{5}{8}$  inches long, two of them  $5\frac{1}{2}$  inches wide and one  $4\frac{5}{8}$  inches wide. Nail and glue the two  $5\frac{1}{2}$  inch pieces on the edge of the  $4\frac{5}{8}$  inch piece and cut a block in the top and bottom. Then make the piece marked E out of 1 inch stuff, allowing  $\frac{3}{4}$  of an inch margin on three sides, the back left flush as shown at H. Nail this well on post and set aside.

Cut out of the square piece marked A a hole that will allow foot marked K to fit nicely through. Then cut enough out of back to allow piece marked G G to fit in as shown at L and nail through G G thoroughly into K. Then take hooks marked



nail in four blocks large enough to be a close fit in space between mold in back, put one in top and one in bottom, other two equally spaced between. These should be put in after post is squared off at each end to proper length. Next make the hooks marked c-c-c. Cut them out of  $\frac{7}{8}$  material, make the one marked x on detail in one piece. The one marked CA is made  $\frac{1}{8}$ " shorter than  $\frac{1}{2}$  the length of c c. Then make the feet marked G G and K; make the two feet marked in one piece, the same as the hooks on top.

The one marked K is cut  $\frac{7}{8}$  shorter than  $\frac{1}{2}$  the length of G G. Next make the square part marked A of three pieces of  $\frac{7}{8}$  mate-

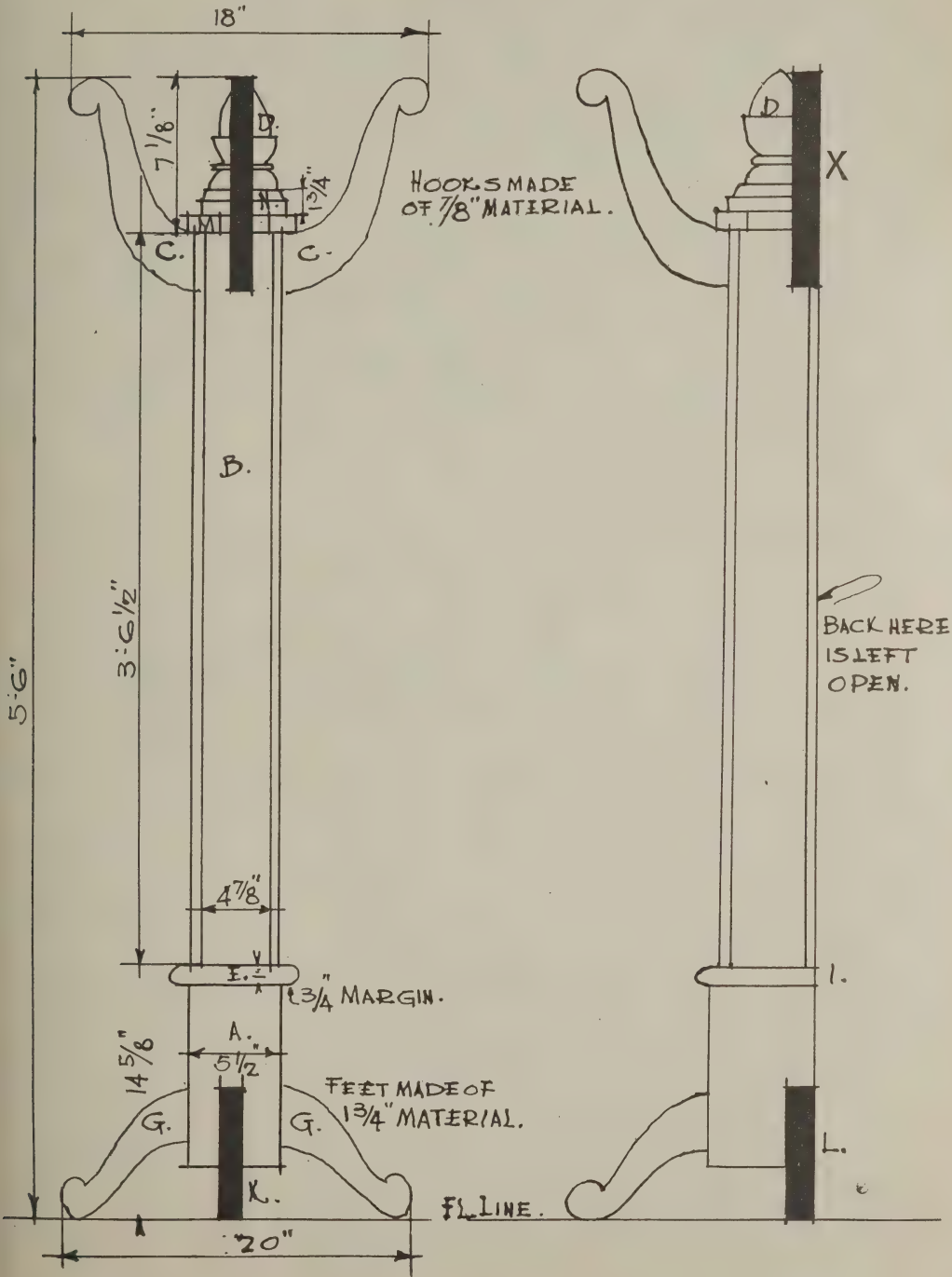
c-c-c and notch for them down into top of post marked B. Put them into place and nail them same as feet. Now nail down through the part marked E on post into square part marked A. Make the cap marked M of  $\frac{7}{8}$  material, allowing  $\frac{3}{4}$  inch margin all around except back and nail on.

The part marked N is round, turned out of a piece of  $1\frac{3}{4}$ " thick and  $4\frac{7}{8}$ " in diameter.

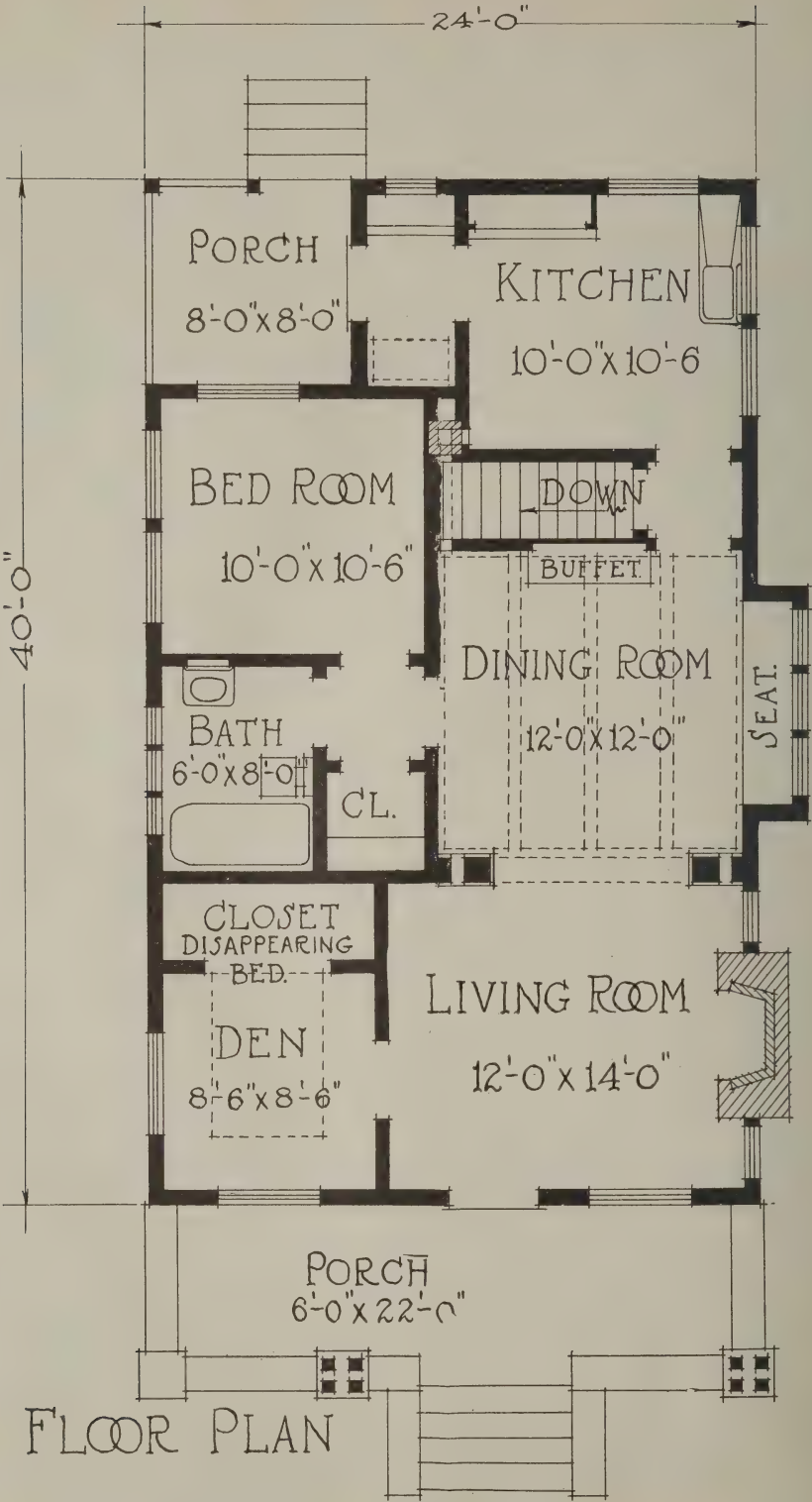
The part marked D is made of a piece of 4 inch oak turned into the shape of an acorn. It should be finished with a dark paste filler and two coats of varnish, or wax, although stain could be used.

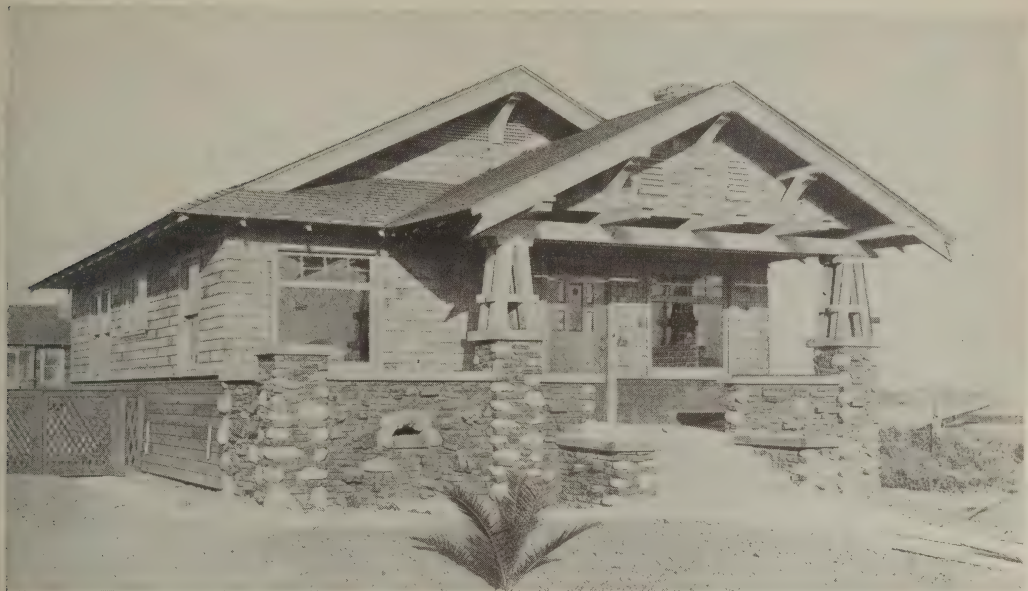
The amount of material required:  
Three 6 ft. pieces 4" oak cove mold.  
Four ft. 1 3/4"x10 oak.  
Eight ft. 1x8 oak.  
One piece 4x4 8" long oak.

Paints—  
One-half lb. paste filler.  
One pint varnish or one-half lb. wax.  
Total cost of material, \$2.00.









Aristocratic Appearance due to Materials and Designs.

# An Aristocratic Little Bungalow

*Jud Yoho, Architect*

A BUNGALOW must by its very nature be aristocratic in appearance to make itself apparent among other more pretentious buildings. It cannot have weight to give it prominence, nor will spreading over a large area make it more impressive. True aristocracy must be obtained by the materials of which it is composed, the general design and the ornamentation which is put upon the building.

In this particular bungalow, the pleasing effects are obtained by the use of rough clinker brick with cobble stones used in the prominent angles and scattered through the brick work to give the right effect. It will be noticed also, that while the porch is entirely of masonry, all the rest of the building is of frame. The foundation from the ground to the first floor line is of rough cedar siding, while the sides above this are of shingles. The heavy construction of the beams used in the porch add greatly to the artistic appearance. In plan, this bungalow is possibly more or less typical in arrangement. The living room and dining room being separated by an arched opening

which readily allows both rooms to be used as one. The den, opening off the living room, is provided with a disappearing bed which greatly increases the value of the space and provides that much more sleeping room for the family or guest. The living room has the ever present fireplace which is most appropriately faced with the same crinker brick as is used in the porch. The dining room, being fitted up with a built-in buffet and window seat, really provides a great deal of built-in furniture which will save considerable expense in fitting up the house. A rather novel arrangement is found in the rear entrance by which the refrigerator as well as some of the other supplies may be kept in the rear entrance or vestibule away from the heat of the kitchen and at the same time not exposed to the outside air.

It might interest our readers to know that this particular bungalow was built in Seattle, Wash., at about \$1,550. It might cost more in other places not so well situated for attaining lumber and other materials.





## LEGAL DECISIONS

OF INTEREST TO BUILDERS

*Prepared for the*  
NATIONAL BUILDER  
*by George H. Murdock*

Where a building contract provided that no alterations should be made in the work as shown by the drawings and specifications, except upon a written order of the architect, extras not made upon any order of the architect or agreed to as extras did not entitle the contractor to extra compensation.—*Archer v. Franklin County School District No. 1*, 138 P. (Wash.) 299.

An architect, employed by the owner of a building, is bound to furnish plans and specifications prepared with a reasonable degree of technical skill, and such as would produce if followed, a building of the kind called for, without marked defects in character, strength, or appearance.—*Trunk & Gordon v. Clark*, 145 N. W. (Iowa) 277.

A building contract including a provision that the contractor was to furnish any necessary thing which might have been omitted from the specifications, and, for the contract price, to furnish all requisite materials, did not include work which was necessary to be done on adjoining buildings to protect the foundation of such buildings.—*Alta Planing Mill Company v. Garland*, 138 P. (Cal.) 738.

Where the specifications in a building contract provided for eleven mantels at a price of \$325, \$25 to be allowed for each of nine mantels and \$50 for each of the others, but the owner purchased at a price of \$156 two somewhat more expensive mantels in place of two required by the contract, he was not entitled to a deduction on account of such substitution of more than \$100, the specified price of the two most expensive mantels.—*Isaac Sherman Company v. Champlin*, 89 A. (R. I.) 504.

Where a contract for a school building

provided that the brick placed in the walls should be thoroughly wet before being laid, and the architect called attention to the fact that the bricks were not being wet, but was not again upon the work until some thirty days later, during which time part of the wall was constructed without wetting the brick, whereupon he ordered that the wall be torn down and replaced according to the contract, the contractor could not recover the expense of tearing down and replacing the wall as for extra work.—*Archer v. Franklin County School District No. 1*, 138 P. (Wash.) 299.

Where, in an action by architects for services rendered in drawing plans and specifications for a building, the owner counterclaimed for defects in building caused by negligence in drawing the specifications, where the defect complained of is such as may be corrected without unreasonable expense, such expense is the measure of damages, but, if the defect be so intimately connected with the building that it cannot be remedied at reasonable expense, then the measure of damages is the difference between the value of the building as it is and its value as it would have been if made upon correct plans and specifications.—*Trunk & Gordon v. Clark*, 145 N. W. (Iowa) 277.

Under a contract for the construction of a building, which provided that the contractor was to do all that was necessary to protect adjoining buildings, doing all shoring, bracing, and trenching required to that end, the contractor was not required to go upon adjoining property and put supports beneath the foundations of buildings thereon; the contract imposing no

greater liability in that respect against him than that imposed upon the owner by Civ. Code, § 832, requiring him, in making excavations, to use ordinary care not to disturb the support of adjoining buildings.—*Alta Planing Mill Company v. Garland*, 138 P. (Cal.) 738.

Where the owner of a lot, through his authorized agent, ordered a contractor, who was at the time constructing a building upon the lot, to make certain improvements upon adjoining property, there was an implied promise to pay the reasonable value thereof.—*Alta Planing Mill Company v. Garland*, 138 P. (Cal.) 738.

Where a bond given to insure performance of a building contract provided that the parties might make such changes and alterations in the work as they deemed

proper, not exceeding the cost of \$1,000, and that the sureties accorded their consent thereto in advance, they were not discharged by slight changes made by consent of the owner and contractor, not entailing an expense of \$1,000, though the contract did not authorize the making of changes.—*Hiller v. Daman*, 166 S. W. (Mo.) 869.

Where a building contract required an architect's certificate as a condition precedent to partial payments, the contractor is not entitled to a partial payment, where the architect refused the certificate because the work was defective, though, as an additional ground, he based his refusal on the refusal of the superintendent of construction to approve the work, and hence the contractor, having quit work, cannot recover on a quantum meruit.—*Borup v. Von Kokeritz*, 147 N. Y. S. 832.

## Book Notices

Notice—All books noticed in these columns may be obtained from this office at publishers' prices. All postage or express prepaid. (Money and address must accompany all orders.)

**HOW TO RUN AND INSTALL GASOLINE ENGINES:** By C. Von Culin, Norman W. Henley Publishing Co., New York. 100 pages, paper cover with many illustrations. Price 25c. The aim of the author in writing this book was to furnish a pocket instructor to those who use a gas or gasoline engine, but does not have the time to study a technical book on the subject. The instructions are sufficiently complete, however, to enable anyone of ordinary mechanical ability to properly install, care for, operate and repair his own engine.

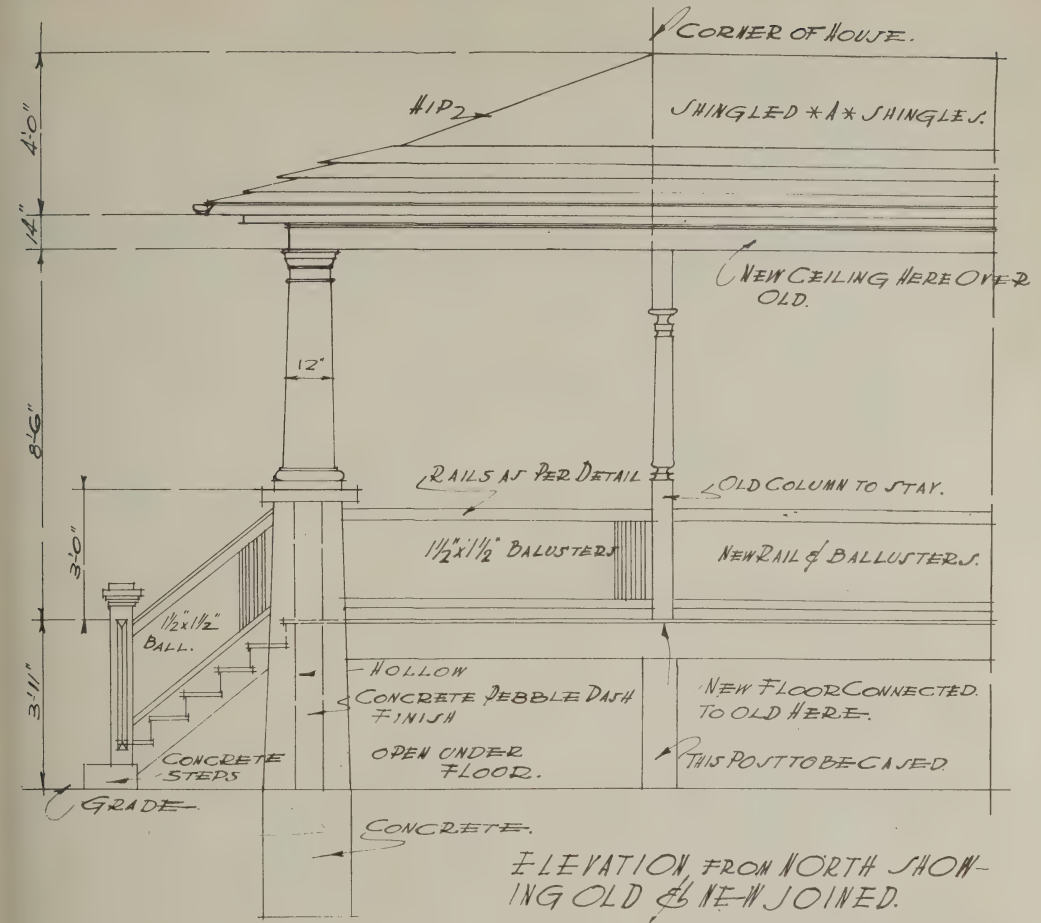
In this day when engines are used for so many purposes in the shop, on the job, for pleasure and for profit, a book of this character will be of immense value. To those already having a more or less understanding of their engine, it will clear up many points which were only vaguely understood before. The several pages of "don'ts" will prevent many accidents and much trouble, while the various other hints are of great value.

It is a book which takes up little space, can be readily carried in the pocket or in the tool box or wherever it is accessible for study or reference.

**BILL'S SCHOOL AND MINE:** By W. S. Franklin. A very jolly little book of 98 pages, and published by Franklin, MacNut & Charles, South Bethlehem, Pa. Price 50c. The author takes two boys, about twelve and fourteen years old, for his central figures. They go to a country school, and have a large area of swamp, river, woods and field to play, work, romp and do mischief in. The pranks and doings of the boys are refreshing and cannot fail of bringing memories to the reader's mind that make him forget he is getting old, or that his love of fun and boyish sport have left him. We took an hour or more pleasing reading out of it, and for a while was a boy again. We quote from another book notice, the following, which we think will cover our estimate of the little book: "The book is delightful, full of ideas that one wants to keep ever in mind. To quote from it is a hard task, inasmuch as every bit of it is so quotable. This little book is well worth reading. It will make you look with more understanding into the eyes of your own little "Bill," and cause dim memories of your own boyhood to live again most pleasantly in your mind.







D. & M. clear Cali. spruce laid with lead and oil in joint.

Plate and cornice to be clear pine or spruce well seasoned when used.

Rails, balusters and moulding to be clear fir or spruce well seasoned when used.

Columns and newels to be built up of clear fir or spruce well seasoned when used.

Rafters, ceiling joist and roof boards to be No. 1 Hemlock of sizes shown.

Ceiling to be clear Y. P.  $\frac{5}{8}$ "x4" D. & M. beaded cleaned for varnish.

Shingles to be \*A\* brand. Shingles to be laid not over  $4\frac{3}{4}$ " to weather.

Steps to be 2"x12" clear spruce, risers  $\frac{7}{8}$ " clear, Strings 2" No. 1 common.

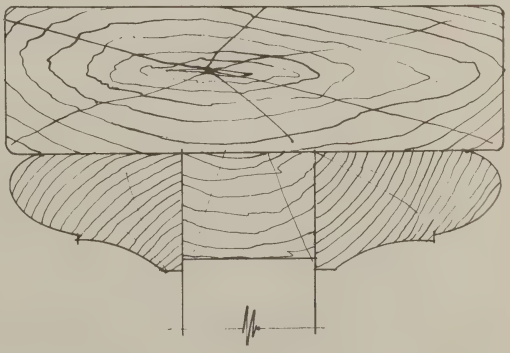
Gutters and deck to be 28 gauge galvanized iron as shown.

Painting to be 3 coats best lead and oil. Shingles dipped in creosote stain.

Ceiling varnished. Color on Porch to match house as near as possible.

Workmanship in the various trades to be done in a first class manner.

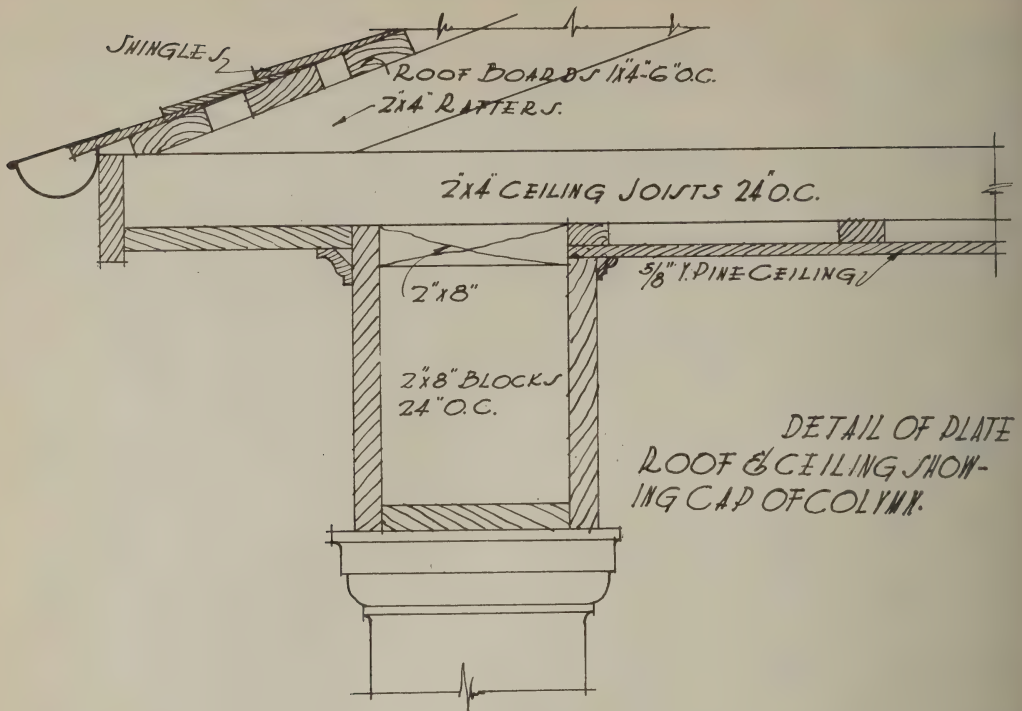
$3\frac{1}{2}$  M \* A \* Shingles.



$\frac{5}{8}$ "x4" D. & M. C. Lr. Y. P.=400 ft.; for ceiling.

76 li. ft. clear 2x6=76 ft.; for rails and foot rails.





76 li. ft. clear 2x4=52 ft.; for rails and foot rails.  
 400 li. ft.  $1\frac{3}{8} \times 1\frac{3}{8}$ =75 ft.; for balusters.  
 250 li. ft.  $1\frac{1}{4}$ " cove, for cornice and hand rails.  
 150 li. ft. 2" crown moulding, for cornice and hand rails.  
 100 li. ft. 3" crown moulding, for cornice and hand rails.  
 4 12"x6' colonial columns.  
 2 8"x8"x4' box newels.

Total cost of above material.....\$175.52  
 Iron work, nails and incidentals... 26.30  
 Concrete and cement work..... 64.00  
 Painting (three coats)..... 47.50  
 Carpenter labor @ 65c per hour... 127.50

Total net cost to contractor....\$440.82

This will give the reader some idea what he must get for such jobs in order to come out on the right side of his ledger.

## Accurate Estimating Essential

Ability to Estimate Is Dividing Line Between the Journeyman and Master Builder

ESTIMATING building construction costs is very largely a mathematical process, but successful estimating often depends upon whether the estimate is made up in a mechanical or in a conscientious way. It requires, in the first place, an analytical mind. In the second place, it demands resourcefulness, while in the third place it calls for a thorough knowledge of a dollar's buying power in the labor and material markets.

It has been said that the ability to esti-

mate is the dividing line between the journeyman and the master builder. It requires more than mere accuracy and deftness in figuring. Experience and judgment are absolutely essential, a working knowledge of building construction, various materials, their market values, and the discounts allowed in the trade is vital. Then he must know how to apply them to the peculiar conditions which surround the operation he is working on. But prices and discounts are constantly changing, and cost of labor is

higher today than at any time in the history of construction and even construction methods are not proof against revision and reform. Building laws must conform to this progression, and what was lawful last year, may, by ordinance, be entirely unlawful this year. These are only a few of many departments with which the estimator must keep abreast, because each change in practice or improvement in material or methods, has a tremendous bearing upon the ultimate price of the operation and frequently, in this age of speculation, upon the final decision of the owner as to whether he will go ahead with his plans or postpone.

#### IN TOUCH WITH MARKET CONDITIONS

It, therefore is apparent that the estimator must keep in constant touch with market conditions. To do this he must depend largely upon his own queries for figures and discounts, but the only way in which he can know that he is getting all the discounts he is entitled to is by consulting market reports and by noting the trend of buying or selling in the wholesale market and the conditions governing the sources of supply and shipment. Despite anti-trust and anti-monopolistic laws, the tendency of the times is to standardize building materials of all kinds and as soon as these are standardized, prices naturally will be on a more or less fixed, or staple level. The price for many building materials today seldom, if ever, change, but the discounts on them fluctuate widely and sometimes suddenly. Glass and hardware are notable examples of this kind of price changing. Other materials, such as lumber, cement, common brick, sand, steel, gravel, crushed stone and cinders are subject to the primary law of supply and demand and their prices are liable to change without warning. There are other materials, such as front brick, stone, marble and roofing material which seldom report a fluctuation, and there are still other materials, like architectural terra cotta, upon which there is no fixed price, a special figure being given by the manufacturers according to the intricacy of the design.

Because of this wide variation in prices, some estimators figure their whole proposition out on a time basis, estimating materials in quantities and keep a cost data system in their offices upon which they can rely when information of this sort is sought

at some future time. This is done whether the bids were successful or not. They afford an opportunity to compare the estimates of cost of the different items, with the actual cost of execution; and if a bid fails to win the job, satisfaction and experience may be gained by noting the items which may have been priced too high or too low. Another source of information is the catalogue. If these are properly indexed, for ready reference, they will be found of great value for specific information. For close estimating, bottom prices and full discounts are necessary so that the estimator here consults the prices quoted by the salesmen direct, guided, the while, by the current market reports in his specialty publication carrying this kind of service.

#### THE LUMP SUM PLAN

It is the practice among small contractors to add a lump sum to the total costs, the size of which depends entirely upon the activity of competition and the circumstances of the operator. If the payments are to be arranged on advantageous installments, so that the bidder can take advantage of the time discounts allowed on all work, he makes his profit a little lower. If long payments (hence heavy interest charges), are specified, then his profit appropriation is apt to be big. Some estimators base their profits upon a percentage of the estimated cost. This varies, in ordinary cases, from ten to twenty per cent, according to the calibre of workmanship stipulated and the selection of material and the expense of handling it. Therefore, locality counts for much in the high or low cost of the work.

Figuring on duplication is an important item especially if the work is of the suburban residential type, where one building will be duplicated many times. A considerable saving is then possible, because certain kinds of material are purchasable in large quantities, either worked or unworked. This is especially true in manufactured parts, such as doors, windows, columns, balustrades, trim and flooring. The distance of the work from the material distribution center has much to do with the profit although when materials can be taken direct from the car to job on a special order, the cost is materially reduced, because then the material has only one hand-



ling and the extent of damage or waste is greatly reduced. Many contractors keep on file data of haulage costs from different sites on which they have figured for reference and in this way they sometimes are able to underbid their competitors on this item alone. The most convenient and reliable of these systems is known as "cubing." It is a system of taking the cubical contents of a building and fixing a price upon it. The rate is obtained by a comparison of plans and requirements with similar buildings which have been erected under conditions as near like those of the job in hand as it is possible to find them.

#### DETERMINING CUBICAL COSTS

There are several methods of determining cubical costs, however. One method is to multiply the square feet in the plan of the building by the height from half the depth of the foundation to half the distance to the roof. Another system uses the height from the bottom of the foundation and another obtains the actual cubical contents. Any of these may be used if the data for comparison is obtained in the same way, but all are subject to important variations which experience and judgment alone will determine. For instance, if the contour of the building is very uneven, with low portions, such as porches and sheds and high portions, such as towers and cupolas, these must either be omitted from the whole and compare separately or a lump sum be added or subtracted according to the size and elevation of these members.

Another variation arises in the sizes of the rooms, giving a ratio of partitions and division walls which is not constant, and of course, a large building with many duplicate parts will require a different rating from a small one, so that the method of estimating by cubing is at best approximate, and its degree of accuracy depends largely upon the experience and judgment of the contractor. Even long experience will afford no safeguard against unusual feature of the interior, so that the cube rates can only be applied to buildings of ordinary character, and comparisons are only reliable between buildings of like descriptions and uses, as the treatment of even the same materials will vary largely in buildings of varying uses. The height of a building will not increase the cube rate

proportionately, unless the internal voids are alike, although it is certain that the higher one builds from the ground the more time and expense it requires to put the material in place, to say nothing of thicker walls or heavier steel and more expensive equipment, especially in elevators.

#### ESTIMATING BY SQUARE FEET

A convenient method of estimating is by the square of 100 surface feet. This is especially applicable to office buildings, schools, mills, stables, garages and all buildings where the floors are few in number or similar in plan. For one-story buildings the price per square is taken to include the roof walls, floor, and foundations, but for buildings of two or more stories the price per square should be taken separately for each floor, the lower floors being prices to include the foundations and the top to include the roof.

This method of estimating by the square is not so accurate as by cubical contents, but the results are often more convenient and adaptable, because the tabulation of the square area of the various floors may be easily reduced to terms of accommodation for public buildings or shops. For instance, a given floor area in a school house means accommodation for a certain number of pupils; in a church for a certain number of sittings; in factories for the manufacture of staple goods, a certain number of machines and operatives. This unit of accommodation is sometimes carried farther and, by the reverse process, is made the basis of another method of estimating the approximate cost of such buildings, i. e., schools, churches, factories, hospitals, mills, etc. This also is used as a method of comparison, the known data being supplied by previous experience or by calculation, and it is often valuable as a means of determining the approximate cost of buildings necessary to accommodate a certain number of individuals or machines, even before any definite plans have been drawn.

All of these methods are approximate, with varying degrees of accuracy. But before using this system as a basis for a contract figure, a sum, governed by the judgment of the estimator of the actual operation, should be added to the total of the original estimate to allow for any possible shortage.—Construction News.

# Building Material Price List

Revised to Date

\*Price not given. yp—Yellow pine. wp—White pine. np—Norway pine. op—Oregon pine. rw—Redwood. s—Spruce. oc—Ontario cedar. h—Hemlock. bc—British Columbia cedar. rc—Red cedar. F—Fir. cdr—Common cedar. cyp—Cypress. bm—Board measure. sls—Sized one side. d4s—Dressed four sides. kd—Kiln dried. rg—Rough. c—Clears.

Dimensions—	Seattle, Wash., Corrected by F. T. Bradley.	Chicago, Corrected by J. H. Touchstone.	Omaha, Neb., Corrected by I. P. Hicks.	Southern Ontario, Corrected by F. O. Frantz.
	M ft. BM	M ft. BM	M ft. BM	M ft. BM
2x4 in. to 8 in. up to 16 ft., No. 1.....	\$10.00	\$20.00	yp \$27.00	h \$27.00
2x4 in. to 8 in. up to 16 ft., No. 2.....	9.00	17.00		22.00
2x4 in. to 8 in., 18 and 20 ft., No. 1.....	10.00	22.00		30.00
2x10 in. up to 16 ft., No. 1.....	11.00	21.00		24.00
2x12 in. up to 16 ft., No. 1.....	11.00	22.00		25.00
2x14 in. up to 16 ft., No. 1.....	12.50	23.00		26.00
Each 2 ft. over 20 ft., add per M.....		1.00	1.00	2.00
Select stock as above, add per M.....	4.00	5.00		*
Exterior Finish, Etc.—				
		M ft. BM	M ft. BM	M ft. BM
1x3 in. to 1x8 in., No. 1.....	27.00	D4S	D4S	D4S
1x16 in., No. 1.....	39.00	yp \$30.00	yp \$45.00	wp \$40.00
1x12 in., No. 1.....	30.00	40.00	43.00	40.00
1¼x3 in. to 1¼x12 in., No. 1.....	33.00	35.00	46.00	42.00
1½ in. and 2 in., same as above.....	33.00	45.00	48.00	45.00
1-in. drop siding, No. 1.....	25.00	45.00	48.00	42.00
½-in. lap siding, No. 1 cedar.....	25.00	25.00	30.00	30.00
		24.00	rdw 30.00	30.00
Enclosing and Fence Boards—				
		M ft. BM	M ft. BM	M ft. BM
1x4 in. to 1x 8 in., No. 1.....	11.00	S1S	S1S	S1S
1x8 in. to 1x12 in., No. 1.....	11.00	yp \$24.00	yp \$25.00	wp \$30.00
1x16 in., No. 1.....	15.00	26.00	24.00	h 24.00
1x16 in., No. 2.....	13.00	*	24.00	24.00
		*	22.30	22.00
Interior Finish, Flooring, Ceiling, Etc.—				
		M ft. BM	M ft. BM	M ft. BM
1x6 in. T. & G. Flooring, No. 1.....	25.00	DS	D4S	D4S
1x6 in. T. & G. Flooring, No. 2.....	22.00	yp \$24.00	yp \$38.00	wp \$40.00
Ceiling, per M.....	20.00	20.00	34.00	wp 30.00
Partition, per M.....	30.00	21.00	22.00	21.00
¾x4-in. Ceiling, No. 1.....	22.00	32.00	32.00	32.00
		22.00	30.00	np 30.00
4¼-in., Moulded Casing.....	\$2.00	100 ft. run	100 ft. run	100 ft. run
4¾-in. Moulded Casing.....	2.50	yp \$1.75	yp \$2.00	wp \$2.50
7¼-in. Moulded Base.....	3.00	2.00	2.50	2.50
½x9¼-in. Moulded Base.....	4.00	3.00	3.50	5.00
1½x4½-in. Moulded Window Stool.....	2.50	4.00	4.00	6.00
	2.50	2.50	3.00	4.00
Miscellaneous List—				
	Per M	Per M	Per M	Per M
Shingles, No. 1.....	2.75	rc \$3.50		bc rc 4.00
Shingles, No. 2.....	2.25	3.00		*
Shingles, Fancy.....	3.50	*	3.75	*
Lath, 4 ft., No. 1.....	2.25	3.60	4.50	6.00
Lath, 4 ft., No. 2.....	1.50	2.75	yp 5.50	wp 5.00
Pickets, 1x3 in. x 4 ft. 6 in., dressed.....	30.00	35.00	5.00	s 3.75
Pickets, 1x3 in. x 4 ft. 6 in., rough.....	20.00	*	30.00	*
		Piece	*	*
6 in. x 8 ft. Post, split.....		cdr \$0.13	Piece	Piece
8 in. x 8 ft. Post, split.....		.17	Cdr \$0.25	*
8 in. x 8 ft. Post, whole.....		.66	.30	*
6 in. x 8 ft. Post, whole.....		.25	.40	Cdr \$0.30
			.35	.25
Hardware List—				
		Cwt.	Cwt.	Cwt.
Nails, wire, common.....	\$2.25			
Nails, cut, common.....	2.10	\$3.00	\$2.85	
Nails, wire, fine finishing.....	2.65	*	3.00	
Sash Weights, cast iron.....	1.60	3.50	4.00	
Tarred Felt Paper, best 2-ply.....	Roll \$1.00	1.50	2.25	
Tarred Felt Paper, 3-ply.....		\$1.00	1.25	1.50
Red Rosin, Atlas brand.....		.90	1.00	
Red Rosin, durable brand.....		.75	1.00	
Black Neponset.....		*	2.00	
Masons' Supplies—				
	Per M	Per M	Per M	Per M
Brick, blue, at kilns.....	*	*	*	*
Brick, blue, at kilns, No. 1.....	*	*	*	*
Brick, blue, at kilns, No. 2.....	\$7.50	*	*	*
Brick, white, delivered, face.....	7.00	*	*	*
Brick, red, delivered, backing.....	7.00	\$7.50	*	*
Brick, delivered, dry pressed.....	18.00	18.00	17.00	
Brick, vitrified, dry pressed.....	*	24.00	*	*
Lime, best gray.....	bbl. \$1.30	bbl. \$1.25	bbl. *	*
Lime, best white.....	1.40	1.25	*	*
Cement, Portland.....	.95	1.85	bbl. 1.70	*
Plaster, calcined.....	2.40	1.80	bbl. 2.50	*
Hair, 8 lb. per bush.....	25	25	*	*

NOTE—While these figures are approximately correct at the time of preparing, the continual fluctuations and shifting of prices make it necessary to advise our readers to consult local price lists when making up tenders.—Ed.



# Advertisers' Symposium

The reader's attention is called to this and the following pages wherein are given personal messages to them from the manufacturers of concrete machinery and supplies. There is much of value in each article, as they are written by experts in their several lines.

These articles are something of a summary of the catalogs, and literature of the several concerns whose names appear. The catalogs and literature will be valuable to the contractor and he should have them in his files.

## To the Readers of The National Builder:

We appreciate the opportunity given to personally address you respecting a building material that has been exploited in the pages of THE NATIONAL BUILDER.

There is no one type of building material that will pay you bigger returns for your consideration than metal lath. In the cities, municipal building codes are making fire protection a necessary part of every building. In the country districts the people are awakened to the fact that America's annual fire loss would bankrupt any other nation, and appreciate the fact that they have greater need of fire protection to offset their lack of facilities for fighting fires.

Investigation proves that the greatest measure of fire protection can be secured at the lowest cost by metal lath and plaster (stucco) exteriors and by metal lath and plaster interior, side walls, ceilings and partitions. With such construction and a non-combustible roof, fire from outside causes would be an impossibility, and inside the building it would be equally impossible for a fire to extend beyond the room of origin.

You are first interested in the cost. Stucco exterior for a \$2,500 residence costs approximately \$72.00 more than clapboard finish; a building of this size averages about 700 yards of interior plastering. You can use Bostwick "Truss-Loop" and plaster for \$140 extra. The increased cost of such construction is therefore \$212, 6 per cent interest on this is \$12.72; a mere trifle to secure a building that is practically fire-proof. The figures we have given are on "Bostwick Truss-Loop." They are \$70 less than on expanded or wire lath, an advantage you will appreciate. Cost, however, is only one feature for consideration.

You must have quality, strength of material.

Bostwick "Truss-Loop" weighs five to eight pounds per square yard, gives practically double the weight and strength of the re-enforcement in general use and enables you to place your studdings with perfect safety 16 inches to 20 inches on centers, thereby securing a reduced cost of framing. The plaster key is the largest, heaviest and strongest found in any metal lath.

If your building needs large weight carrying capacity and you consult the best engineers on the subject, they will unanimously recommend "Truss" construction. In Bostwick "Truss-Loop" only is the "truss" formation used for metal lath. It insures you the greatest weight carrying capacity.

Fire protection for frame construction is your chief consideration; inquiry of the leading architects as to the ideal material for this purpose would demonstrate the high standing of "Bostwick Truss-Loop."

Yours very truly,

THE BOSTWICK STEEL LATH CO.

## Determining Engine Value

By Ed. H. Witte

In buying a gas engine of any kind, it should be remembered that the test of engine value comes in the cost of operation to get the power out of it. This must be figured from the first cost of the engine, cost of fuel, cost of attention in handling it, cost of repairs, and last but not least, the cost of time lost, due to unnecessary shut-downs from engine troubles. Steady power is also necessary, along with continuous power. Manifestly, the engine that shows the greatest efficiency in all these

factors, is the cheapest one to own. These things must be brought out by actual working experience. Our experience has shown that a happy medium between the old-type, over-long stroke engine, and the so-called modern light, over-high speeded motor, is the most economical kind of an engine for general purpose work, especially for the shop, or outside machinery that requires frequent moving, such as concrete mixers, saws, and the like. The Witte engine of today is the result of 28 years' continuous effort in the same factory, by the same man (myself), to produce a reliable engine to furnish cheap power. Its success is attested by nationwide sales of many thousands of engines each year. Sales have more than doubled each year for the last five years, a big fact which is due to the work of the engines themselves, more than to any other thing. As compared with engine designs of 15 and 20 years ago, it is not unusual for a Witte to more than pay its own cost in a year, in fuel saving alone, using the same horse-power from the various types of engines. This fact is due to the lower first cost of the Witte, and to the improved design, in which the number of parts is reduced to the fewest possible, with each part itself of the simplest design. The simplicity of the engine permits economical manufacturing, gets the power with less fuel, and reduces vibration and wear—which latter makes for durability with reliability. Added to economy in manufacturing, is the economy in selling—direct to the user. Price and terms no longer need stand in the way of anyone doing without an engine, who needs one. Engine power is now cheaper to use than not to use. Every man who is doing any material amount of work, that can be hitched to a belt, without an engine, is paying for a Witte engine and still not getting the engine. Might as well have it, under such circumstances, as the advantage is all in favor of the engine.

### The Action of a Mixer

For the general contractor the advantages offered by a machine which will perfectly mix concrete, mortar and plaster without change or readjustment, are most obvious. Up to the advent of the Blystone Batch Mixer—"the machine that shovels"—contractors had despaired of the possi-

bility of such a thing. At the present time, however, something over 1,300 Blystone mixers are demonstrating daily—to the profit of their users—the practicability of one machine, built on correct mixing principles, doing all three kinds of work.

The Blystone Batch Mixer shovels. It does not depend on gravity to tumble the material around, whereby the heavy material falls away from the light, or the coarse stuff separates from the fine. The shovels of the Blystone get right down under the material and shovel it over forty-four times a minute, at the same time shifting the batch from one end of the open drum to the other with every revolution of the shovel shaft. The shovels (not paddles in any sense of the word) are adjustable so that wear can be taken up as it occurs.

The efficiency of the Blystone as a hard wall plaster mixer was discovered when it was used on the Machinery Palace when that building was built for the Panama Pacific Exposition. It was found that the rapidity and thoroughness of mixing saved the plastering contractor as high as \$25.00 per day on this job. Since this demonstration the Blystone has been adopted by scores of the largest contracting plasterers in the United States, and has been used to advantage of such jobs as the State Capitol, Salt Lake City; the new State Building of Missouri; the big Whitney Building, and the Detroit Athletic Club, Detroit, Mich.; the mammoth Rosenbaum Building, Pittsburgh, and dozens of large skyscrapers in Chicago and other cities.

So thoroughly will the Blystone mix practically dry material, that it has been installed in over 500 foundries in the United States for mixing core sand. This service, where oil, water, molasses, flour, compounds, etc., are mixed through dry sand at 1 to 60, is probably the most severe test to which a mixing machine can be put. The Blystone has practically replaced every other machine on the market for this work. If it is successful in this work, think of the possibilities when the machine is handling concrete, plaster and mortar.

The open drum of the Blystone means that the whole mixing operation can be watched and controlled. Cleaning of the machine, so important in plaster work especially, is too easy to be neglected by the



laziest workman. There is no drum to be turned; no attachments to eat up power and get out of order. Every ounce of power mixes. The secret of the Blystone's success is that it is built on correct mixing principles—it shovels.

### Why a Self-Measuring Mixer?

The inaccuracies of measuring the materials are generally quite forcibly illustrated on any concrete jobs where the materials are measured in wheelbarrows. The next time you are near construction work where a Batch mixer is used see for yourself the marked difference in loading. Each barrow presents the individual's conception of a load or perhaps his mental or physical condition at the moment. It is not surprising that concrete often varies greatly in strength and uniformity. A prominent contractor recently stopped ten of his wheelbarrowmen and had each man's load measured. The loads ranged from three and one-quarter cubic feet to five cubic feet, although each load should have been four cubic feet. Occasionally an entire barrow-load was left out, or an extra one added. More important is the possibility of the individual, whose attention may be detracted for a moment, to leave out entirely the cement in a batch. And again, for your own satisfaction, take particular notice at your first opportunity to see how this can easily happen in actual practice.

Compare this method with the way in which the materials are automatically proportioned with the EUREKA mixer. The uniformity of the concrete is not dependent upon the varying wheelbarrow load. We must all acknowledge that accurate measuring is equally as essential as thorough mixing. An accurate test of the measuring can

be made by anyone in a few moments. If the feeders are set for proportions of 1:3:5, put one pail of cement in the cement bin, three of sand in the sand bin, and five of stone in the stone bin. Start the machine and note that the three bins empty simultaneously. The uniformly good concrete produced by thousands of Eureka mixers on all classes of work has established thoroughly the reliability of the Eureka self-measuring principle. Engineers and contractors who know the quality and quantity of work the Eureka can do are our best advocates.

Another feature that is considered undesirable in the Batch type of mixer is irregularities in the time of mixing. One batch may be mixed two minutes and the following batch may be discharged within ten seconds. The American Concrete Institute recently gathered data from fifteen different jobs where seven Batch mixers were used. The speed of the mixers is shown to have varied from seven revolutions a minute to thirty-two revolutions. The time of mixing ranged from ten seconds to two minutes. In one instance a machine was run at sixteen revolutions per minute and the aggregate allowed to mix for just ten seconds. On another job the same machine ran at the same speed but the time of mixing was nearly a minute.

The point is just this: At best the Batch method of mixing is highly uncertain and always subject to the variable man-factor, which is not the case with the Eureka self-measuring mixer. When the Eureka is used, uncertainty gives way to certainty. Dependence is no longer placed on the individual. The human element is eliminated. The feeding, the proportioning, and the timing are all done by the machine. It is exact science versus guesswork. There is no getting around the indisputable logic of the Eureka self-measuring mixer. It is the solution of the problem of getting uniformly dependable concrete construction under all conditions.

## Screw Holes That Hold

Don't put screws in wood—the thread in the hole wears out and the hole has to be plugged.

Use **Stine Screw Holes**, made of brass, driven into the wood. Will hold the screws tight everlastingly.

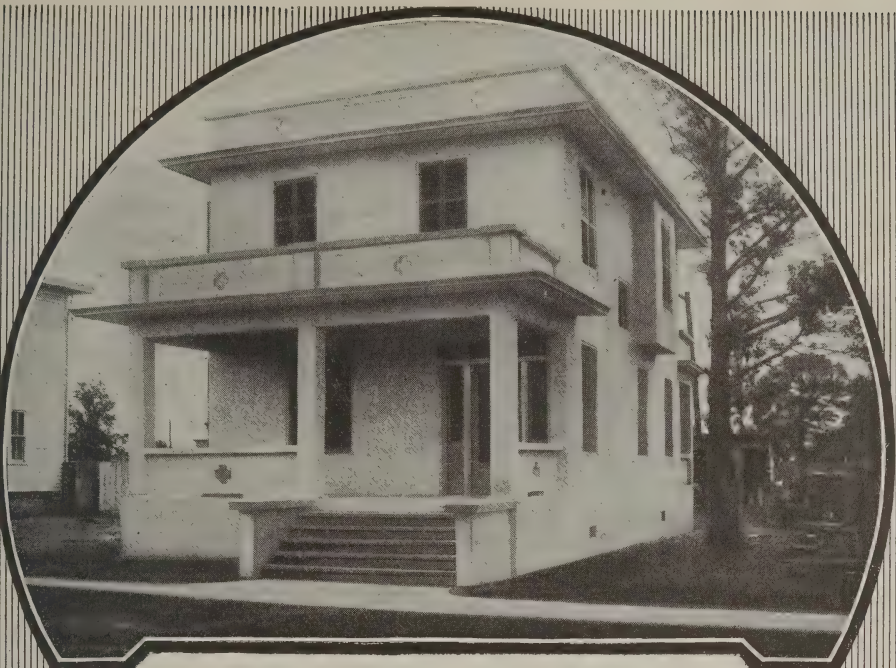
Furnished in all sizes for all kinds of work—wood, glass, marble, plaster of paris, stucco, cement and all kinds of metals.

Samples free to architects, contractors and dealers. Write today.

**STINE SCREW HOLES COMPANY**  
Corner Main and North Decatur, Ill.

### The Proper Engine for the Contractor

In this present age of labor saving machinery, when everything must go just so at the right time; when every detail must be carried out carefully and at the same time with speed, when the result depends upon promptness and accuracy and time,



## The Cottage Everlasting

Is the one that has walls constructed with good cement.

Stucco and solid concrete are economical to maintain and make a substantial, comfortable, handsome house. The illustration above is a view of a concrete house erected by the Chatham Real Estate and Improvement Co., of Savannah, Ga., and built with

# ALPHA PORTLAND CEMENT

*The High-Water Mark of Quality*

ALPHA satisfies the discriminating architect and builder because it is tested hourly for quality by chemists in all the six great ALPHA plants. In composition, exact burning, and fine grinding, ALPHA is an exceptional cement. It represents 24 years of high-quality policy and is warranted to more than meet all standard requirements.

*Send for the ALPHA Book No. 15, giving valuable information about cement and concrete work generally. This illustrated book tells how to do stucco work, how to build concrete barns, silos, ice-houses, and other small concrete buildings, walks, tanks, storage cellars, steps, etc.*

## ALPHA PORTLAND CEMENT CO.

GENERAL OFFICES: EASTON, PA.

Sales Offices: New York, Chicago, Boston, Philadelphia, Pittsburgh, Buffalo, Baltimore, Savannah.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



the question of the power plant for contractors' equipment is not to be overlooked without serious loss.

The general contractor taking a big contract is generally so bound by it that he must complete the job on time or pay the forfeit; and as no small part of the contractor's success depends upon his cement mixer, hoist or air compressor, a failure at the time when either of these machines is scheduled to do means the loss of time on the contract, the idling of employes and possibly a serious delay on the job itself that may demand the forfeit besides hurting future business.

Previous experience has taught that the entire success of contractors' machinery depends upon the power for driving it.

Gasoline engines are considered by most contractors to be proper power for their equipment because of their light weight and ease of operation and maintenance in comparison with steam power. The contractor is the last person in the world who should choose a cheap, meanly constructed engine on any of his machinery—so much depends upon the power equipment that the best engine in the land is none too good.

The contractor's engine goes through the most gruelling kind of conditions, the hottest and coldest of weather, the long steady racking work, the lack of attention, and oftentimes abuse. Consequently in order to deliver perfect service the engine must be fool proof—not subject to the weather and well built of high-class material.

We have in mind an engine that has stood the strongest kinds of endurance tests for the past ten years and is ever ready, ever willing to start out with the contractor and stick with him to the finish with the minimum amount of attention, upkeep and fuel—The "NEW WAY" Direct Cooled by Air Engine manufactured by the "NEW WAY" Motor Co., of Lansing, Mich.

The "NEW WAY" Motor Co., realizing that there was an unusual opportunity for a vast number of advanced ideas in engine construction and that a practical and economical engine was necessary, went into the engine business some ten years ago to build and market an engine that would give years of lasting service at a minimum cost, both for fuel and upkeep.

The "NEW WAY" Motor Company has been building engines throughout the world for the past ten years and now has scores

of thousands of engines giving perfect satisfaction, which bears out the fact that the superior features on "NEW WAY" Air Cooled engines makes the engine durable, reliable and economical.

### Portland Cement

Portland cement has had a wonderful, almost a romantic, history. In 1900 only 8,482,000 barrels were manufactured in the United States. In 1914 nearly 100,000,000 barrels were sold.

Used originally only in great engineering undertakings, heavy foundations and the like, Portland cement has grown so popular as a building material that now one of the largest fields is in the building of a great variety of home-and-farm concrete improvements. Even concrete burial vaults has become a good-sized industry.

As a natural result of all this, Portland cement has become very much a staple product, almost as staple as flour. It is made today by a large number of companies, at many different points in the country, and out of many different materials. Despite the standardization of Portland cement, there are today many different kinds and grades sold.

Cement is the sinew of the concrete job, and the sinew cannot be of too high quality. A cement expert says in *BETTER ROADS AND STREETS*: "The production of Portland cement is an extremely scientific proposition requiring the exercise of the greatest care and long experience. It is a scientific and chemical procedure representing the antithesis of guesswork or slipshod methods." The United States Government, in one of its recent bulletins, says about the same thing in different language.

ALPHA cement is made at six plants, well known for the high quality of raw materials furnished by the quarries. ALPHA was a pioneer American Portland cement that came into sharp competition at the outset with the imported Portlands, then thought to be superior to anything produced in America. The policy of the ALPHA Company from the very beginning has been to produce the highest quality of Portland cement that can be made. Its chemists have been men of authority—"real bosses." No zeal of mechanical men for large output can interfere with the decisions of ALPHA chemists. They test

# BEAVER BOARD

## WALLS & CEILINGS

### "It's Great Stuff, Boys"

"You fellows who don't know about BEAVER BOARD are over-looking a good bet. Just take a tip from me and look around a bit. There's any number of people waiting to be shown, and that's easy.

"Take Bill Swanson over here in Brownsville, for instance. He found a lot of folks in town who wanted to remodel their houses. Some of 'em had rooms they didn't like because the plaster was all shot to pieces—any place from the attic to the living room. So Bill got busy and showed them how easy it is to put BEAVER BOARD over old plaster and make a dandy looking job. After he'd made a few rooms look like new, people began to sit up and take notice. The result is that Bill has got all kinds of BEAVER BOARD jobs, lots of 'em in new houses, too, instead of lath and plaster.

"And, by the way, don't get the notion that every wall-board is BEAVER BOARD. It was the first thing of the sort ever made and has everything else beat to a standstill. Pure-wood-fibre all through and sized on both sides so's to stand any changes in climate or temperature. It's extra well protected in the back where it can't be painted.

"Ask the Companies' Builders' Service Department to put you on their mailing list for all their literature."



TRADE MARK

### The Beaver Board Companies

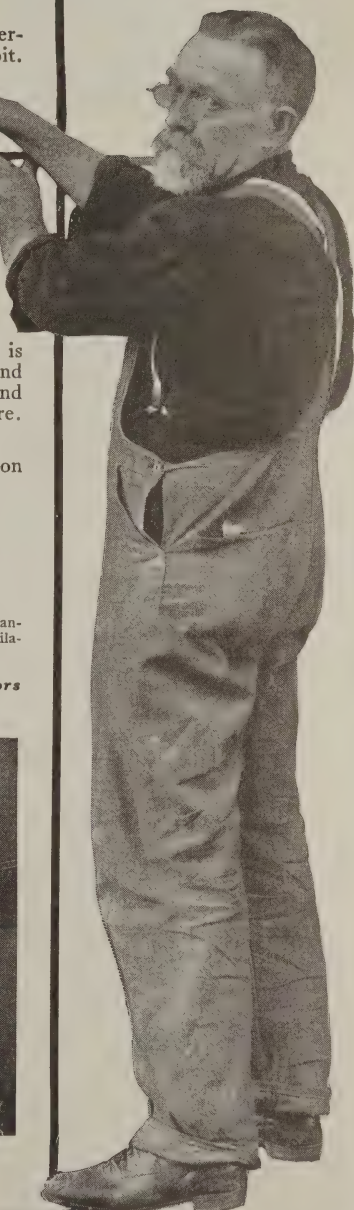
United States: 660 Beaver Road, Buffalo, New York  
 Canada: 860 Wall Street, Beavertown, Ottawa  
 Great Britain: 4 Southampton Row, London, W. C.

Branch Offices in Baltimore, Boston, Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Mo., Minneapolis, New York City, Omaha, Philadelphia, San Francisco.

*A cordial invitation is extended to builders, contractors and carpenters to visit any of the above offices*



This is a reproduction from an actual photograph of a Long Island home, where BEAVER BOARD has been used to good advantage.



PASTE THIS DOME  
 WRITE TO ADVER-



ON LETTERS YOU  
 TISERS. IT HELPS.



ALPHA cement every hour, day and night (when plants are working at night)—in order that ALPHA may meet more than standard requirements as to strength and uniformity. With this strict supervision, the Alpha Cement Company is enabled to guarantee that every barrel of cement shipped has been properly proportioned as to the raw material, been thoroughly burned, finely ground, and will more than meet standard specifications.

Other cements might do as well, but if you "Specify ALPHA" you can be sure.

ALPHA PORTLAND CEMENT Co.

By S. Roland Hall.

### Archer Special Concrete Mixer

First look in the index and find the Archer Iron Works advertisement. It shows a picture of the Archer Special Mixer. Study and refer to this picture while you read what follows.

The Archer Special is a  $4\frac{1}{2}$  cubic feet of wet concrete per batch mixer, or 6 to 7 cubic feet of dry material per batch. It's what we call a one-half sack mixer, because the mixing drum is just the right size to take any proportion of mix requiring one-half sack of cement.

Now notice in the picture that it is an end discharge mixer. That means the mixed concrete pours out of the end of the mixer as it should, not out of the side. This feature enables you to spout concrete directly into the forms. It also means that the machine can be worked in narrow places, between sand and stone piles, on narrow platforms only 48 inches wide, or in between sidewalk forms.

The Archer Special is portable. It is easy to move around on the job, easy to move anywhere. One man can lift it up at the platform end, and it can be swung around end for end in five seconds. You cannot possibly do that kind of moving and shifting around with a four wheel side discharge mixer.

We claim our mixer will mix 50 cubic yards of wet concrete per day. The same thing is claimed for some mixers having mixing drums smaller than the Archer drum, but we take no chances with our statements. One contractor who was afraid we wouldn't believe him made affidavit that he mixed and placed 65 cubic yards of wet concrete in eight hours. This same con-

tractor later mixed 55 yards per eight-hour day for eighteen and one-half days straight. On January 6th a letter came from a contractor in Oklahoma who said "I am working your little mixer on street work alongside of a big 17 cubic foot ——— road paving mixer. Naturally your machine won't mix quite as much per day as the big mixer, but it does it cheaper." Think of it—a \$225 Archer Special working alongside of a \$1,200 mixer and doing it cheaper. It all goes to show that when you buy the low priced Archer Special you are getting a real money earning tool that you can use with enthusiasm and satisfaction.

ARCHER IRON WORKS.

2435 West 34th Place, Chicago, Ill.

### Steel Forms for Concrete Buildings

The development of the Lambie Steel House Forms has not been solely a money-making proposition to me and it never can be such. Not that I despise the good things of life by any means, for I am far from being a rich man and probably shall never become wealthy; but to me the concrete house, built at a cost where it is within reach of the average pocket book, is an ideal toward which I have bent every effort for seven years.

I built the first concrete dwelling in Montclair, New Jersey, because the carpenter contractors asked too high a price for frame houses; and when I saw how durable concrete houses were I began working on a steel form which would build them and eliminate the large waste of labor and material incidental to wooden forms.

The first set of forms I used were made of steel channels but were placed horizontal instead of perpendicular as they are now set. Then I conceived the idea of cutting the channels to the height of one story, making an inverted box of each story and the hardest part of the problem was solved.

The next step was the release angle on top of the inside form which permits the removal of the wall forms without disturbing the ceiling plates and the simplification of the forms whereby the forms are interchangeable for the walls and floors.

The last advances were in providing simple means for furring out and plastering and for varying the height of each story.

That the forms have reached their ultimate perfection, I doubt; but the con-

# Get after Spring jobs

It's time, right now, to get good and busy with the people you are going to build for in the spring. Time to arrange the details of the buildings you are going to put up in the spring. You can give the builder better service in every way if your plans are all worked out early.

## Send lumber bills for H-L-F price

The price you get from H-L-F will be way under that you can get locally—and the quality of the lumber far higher than any local dealer handles.

Owning and controlling the forests—producing the lumber ourselves—and selling direct to the lumber user—we effect a tremendous saving—\$75 to \$500 on a building job, according to the size of the bill—a nice tidy sum to add to your profits.

## Have your lumber ready when spring opens

Shipments of lumber are going through like clock work this year. Less volume of freight moving than usual. Our mills are ready for your orders with a fine big stock. Your order will be filled within 24 hours of receiving. You'll get the lumber within a couple of weeks or so—all ready for going ahead when the foundation is in.

**Send along your material lists soon as you can  
for quick price and send the coupon now**

**Hewitt-Lea-Funk Co., 609 Crary Bldg., Seattle, Wash.**

Capital \$1,000,000

Not in any trust or combine



### Saved \$300 — full count

I have saved good three hundred dollars. The Hewitt-Lea-Funk Company didn't miss an inch of lumber. Andrew Tatarek, Wells, Minn.

### Is pleased— saved \$200

I am well pleased with the lumber, and it saved me good \$200. Matt. Schauf, R. F. D. No. 2, Sparta, Wisconsin.

### Saved \$175—Quality O. K.

Saved about \$175 on car of lumber, and quality is O. K. Better than we could have purchased here at local yard. F. F. Stuart, Gillette, Wyo.

### Saved \$250 and no waits for materials

Received the carload of material O. K. It came sooner than I expected by about four days. I am saving about \$250 on lumber by ordering from you, and furthermore, I will not have to wait for material, as these local lumber yards do not have the lumber on hand and they hold up the jobs. A. W. Prust, Wilton, N. Dak.

### Saved 30% on \$600 bill

The car of lumber and shingles for Mr. M. L. Townsend was all O. K. "Checked up to a foot." This is as good a car of lumber as I ever saw, and I have seen and worked a great many carloads of lumber. Saved 30% at least by buying from you. James A. Roach, Contractor and Builder, Grand Rapids, Wis.

### Saved \$260. Will buy all H-L-F lumber in future

The two carloads of lumber arrived Nov. 14, which you shipped me. It came sooner than we expected. I could not have gotten a better grade here and I saved \$260. My acquaintances who saw the lumber say it is far ahead of what the dealers have here. In the future, I shall buy my lumber and building material from you John Loritz, Hebron, N. Dak.

### Estimates by experienced men

Our estimating department is on its toes, in great shape to give you quick service. Our estimators are experienced men. They know their business.

We guarantee grades and guarantee satisfaction or money refunded.

**HEWITT-LEA-FUNK CO., 609 Crary Bldg., Seattle, Wash.**

Gentlemen:—Please send me the following:

- ☐ Delivered, freight-paid price on enclosed list of materials (no charge).
- ☐ H-L-F House Pricer (free). ☐ Plan Sheet (free).
- ☐ Information on H-L-F Stud and Wall Board Construction.
- ☐ Prize Plan Book (send 10 cents). ☐ Barn Builder's Guide (send 4 cents).
- ☐ Millwork Catalogue (free).

Name \_\_\_\_\_

Street or R. F. D. No. \_\_\_\_\_

Post Office \_\_\_\_\_

State \_\_\_\_\_ Business \_\_\_\_\_

I will send list about \_\_\_\_\_

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ON LETTERS YOU  
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tractors who have been using the forms in Pennsylvania, Connecticut and Massachusetts in 1914, have been very enthusiastic and they have also been very glad to co-operate with me in helping to bring the forms to their highest usefulness.

One of these contractors, Mr. A. H. Olmstead, of East Hartford, Connecticut, has shown great ingenuity in many uses to which he has put the forms. He has built ten different structures, varying in form from a silo of 12 feet in diameter and 30 feet in height, to a nine room house. The second house he built was 25' x 28', and the total cost including plumbing, heat and lighting fixtures, all ready to move into in fact, was \$2,337.73.

The large corporations which have investigated the system realize that for the first time it is possible to build a monolithic concrete house, in which the maintenance is at the minimum and in which the tenants comfort is at the maximum, for about the same cost as frame, and they are rapidly taking it up.

So too, real estate developers are being pressed by prospective home seekers to build modern, fireproof houses, while others realize that the developer who presents this feature to his client takes the business.

Now that I have the rental of these forms on a basis where the form cost is about 20 per cent of that for wood forms, and where I can show the labor cost to be about two cents per square foot of wall or ceiling surface, I think I can safely predict that concrete houses will be built by the thousand and that we may hope to reduce the fire loss in a large degree.

FRANK D. LAMBIE.

### **The Value of a Small Concrete Mixer to the Building Contractor**

Within recent years building operations have greatly changed to meet the more exacting requirements of the twentieth century structure. The great cry has been for more speed and the absence of delays, costly and expensive to the building contractor. The average builder is confined to a few months in the year when he must make the most of that short period.

A few years ago the contractor sublet his foundations, floors, and other concrete work. When the contractor was ready the

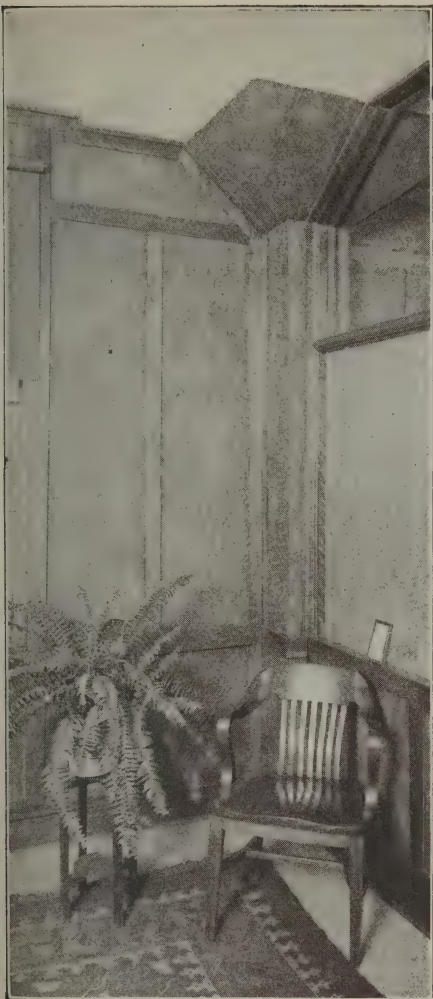
concrete contractor was away on some other work and then matters dragged along and the work "marked time" until the concrete contractor could get his work completed and the building contractor could start his work.

If the reader thinks over his experience, he will find dozens of instances where a small mixer would have been worth its weight in gold to him. A small mixer is a good practical machine for a builder to have because it is easily moved around, requires very little space, is easily set up, requires no expert operators, and will do the work cheaper and quicker and better than mixing, and cheaper than the same work could be furnished on contract.

A small machine is also a splendid mortar mixer, handling cement mortar just as well as concrete and enabling you to mix the mortar for your work as well as concrete. There are so many mixers on the market that it is difficult to select the best machine for the purpose.

One of the best mixers built for the building contractor is the "Little Builder," manufactured by the Lansing Company, Lansing, Mich. These people have been manufacturing machinery for thirty-four years and their machines have a reputation for being great money-makers, convenient to handle, of good capacity, and well designed. One of their great faults is putting on more power than is needed, but since plenty of power is a splendid thing the contractor gains because of their generosity in this respect.

Another good feature about the Lansing Line is the fact that they manufacture concrete block machines, concrete pipe molds, concrete brick machines, wheelbarrows, trucks, concrete carts, mortar hods, brick hods, and a complete contractors' line. Since every builder buys or uses more or less concrete blocks, we believe that it would be well to look into their line, with a view of making the blocks for each job right on the job, if desired, and save this extra expense also. We stand for more money for the building contractors and, as such, are pleased to recommend this line of machinery for the consideration of our readers.



*There is some man in your locality who would like to have a good-looking office like this if he knew that it could be accomplished with UTILITY Wall Board. This illustration gives only one of many panel ideas for UTILITY in this class of service.*

## More business this Winter

More business for you—lots of it—right in your own locality—during the dullest season; line the walls of some man's office, billiard room or garage with

## UTILITY Wall Board

The profit you make is sure, quick and liberal. The first job of this sort that you do will pave the way to many more. UTILITY Wall Board is ideal for turning unused space in any home into attractive rooms. For garage use, UTILITY is inexpensive, sanitary and good-looking.

**Let Us Send Specimens—  
Write Today**

Convince yourself what an extraordinary wall board UTILITY really is. Let us send specimens and other information. Let us give you more suggestions as to the business—bringing assistance that UTILITY holds for you during dull seasons. Write us now—today.

**OUR WOOD GRAINED BOARDS WILL SOON BE READY TO SHOW**

## The Heppes Company

*Manufacturers Also of Asphalt Paint, Asphalt Roofing in Any Finish  
and Flex-A-Tile Asphalt Shingles*

**4502 Fillmore Street**

**Chicago, Illinois**

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## The "SSS" Low-Charging Mixer

Manufactured by

The Standard Scale and Supply Co.

One of the biggest boons to building construction in the past few years has been the development of concrete mixing machinery. Heretofore the main cost in producing concrete has been the expense of labor. Many contractors have remained out of the field of concrete construction because they have felt that the amount of such work would not justify them to buy a high priced mixer and at the same time they found that most of the small concrete mixers could not turn out the quantity and quality of concrete suitable for this class of work.

To meet the requirements of contractors who wanted a good sized mixer and at a very low price, we placed on the market a few seasons ago the "SSS" Low-Charging mixer. Immediately public interest was aroused and today several thousands of these mixers are in use.

The chief feature in design of these mixers and one which is very much different from other mixers on the market is the method of charging. Instead of the charging point of the chute being high above the ground it is but 24 inches in the "SSS". This advantage can be easily appreciated by simply placing the mixer near the material and shoveling into it, counting the shovelfuls to get the proportion. If the charging from barrows is preferred a folding platform can be furnished. To it short inclines can be laid up which the materials can be wheeled.

Contractors will find that the "SSS" mixers with capacities from 2 to 7 cubic feet per batch to be the handiest tools that could be owned. They will mix mortar, cement, plaster, concrete, in fact anything that is to be mixed, and will do it one-third cheaper than by hand.

The drum is open so that the batch can be inspected at any time. By this feature of construction the drum can be easily cleaned for every part of it is within easy reach.

The mixers are light. They can be transported from floor to floor, through an ordinary door or to any position as the building progresses.

The "SSS" mixers can be furnished with

hand power, with gasoline engine or ready to connect to engine, and either on trucks or skids.

We cover all mixers with a guarantee of satisfactory service.

Full descriptive catalog with illustrations of our different types will be mailed upon request.

We carry a complete stock at all times. Mail orders are promptly filled.

Any further information will be gladly given by getting into communication with any of our branches at Chicago, Pittsburgh, New York, Philadelphia or Cleveland.

## Northwestern Concrete Machinery

Our limited space will not permit us to give you all the detailed information as to the advantages of our line of equipment, because it covers such an extensive line, going into almost every branch of the concrete industry.

This detailed information, however, is fully covered in a sixty-four page catalog which we issue and which we would be very glad indeed to send to any of your readers, who will write us requesting this catalog and telling us as to what branch of the concrete industry he is particularly interested in.

It is needless to say here that concrete is gradually supplanting lumber as a building material. This change in building construction has necessitated the various carpenters and builders throughout the country to enter into the general contracting business in order to follow their chosen profession.

Northwestern concrete machinery, taken as an entirety, is of particular advantage to every contractor and builder, in that we offer a complete line and furnish tried out equipment, meeting all the necessary requirements as to efficiency, usefulness and durability. Many carpenters and builders hesitate to embark in general contracting because of the initial investment which the majority of them figure as being a very big item. The Northwestern line is of greatest importance and advantage to every contractor and builder, in that we can furnish all the equipment that he needs at the smallest possible investment.

The line embraces batch mixers in vari-



# You Can Save \$3,000 Just as Geo. Drenner Did

GEORGE DRENNER  
CONTRACTOR AND BUILDER

POLO, ILL. November 10, 1914.

Gordon-Van Tine Co.,  
Davenport, Iowa.

Gentlemen:

Am mailing you today photographs of some of the buildings which I have erected this year in Polo. These buildings have been built with Gordon-Van Tine material and I am so very much satisfied with the treatment that you have accorded me and the quality of goods that I have purchased from you that I feel it due to tell you.

I have bought from you in the past four-teen months a little over \$10,000.00 worth of lumber and millwork and I figure that I have saved about \$3,000.00 on this material.

Considering the big saving that I made together with the splendid service and very high grades, I cannot help but be satisfied.

You are perfectly at liberty to use these photographs and this letter in any way you desire. And I wish to add that this letter comes from me unsolicited.

Sincerely yours,

*Geo Drenner*

GEORGE DRENNER, the Polo, Ill. Builder, who put up these buildings, bought every stick of the material from Gordon-Van Tine. Read his letter. On \$10,000 worth of material he saved \$3,000—30%. Now \$3,000 is a nice profit itself. But \$3,000 additional profit is velvet. That's what he made through dealing with Gordon-Van Tine—all ordinary profit *plus a handsome \$3,000 bonus.* He bought on our money saving "mill-to-user" plan and put into his own pocket the \$3,000 profit that the local dealer would ordinarily have taken.

You can do the same. There's no reason why you should pay tribute to a local lumber yard for doing nothing. Deal with us. We ship to you anywhere, no matter where you live and guarantee safe delivery and absolute satisfaction or money back. Try us.

**Write FOR  
5,000 Bargain  
Catalog NOW**

GET this big, illustrated, 156 page price-making volume. A ver-  
table Builders' Encyclopedia.  
Packed from cover to cover with  
money-savers, Lumber, Millwork,  
Roofing, Builders' Hardware, every-  
thing. Over 5000 extraordinary bar-  
gains. Sold by mail only. All at  
wholesale prices. Large or small  
orders receive equal attention.  
Prompt shipment and safe delivery  
guaranteed. Satisfaction or money  
back—you are the Sole Judge. Over  
10,000 Contractors and builders deal  
regularly with us. Our regular plans  
and blue prints cost you nothing. Or  
our architectural staff will draw  
special plans to your instructions if  
you wish. Cost but a fraction of  
what local architects would charge.  
Our free estimates are "Guaranteed  
Right"—No Extras. Send now for  
this great 5000 Bargain Catalog, tell  
us what you want and let us give  
you a figure on your needs. Put us  
to the test.

**GORDON-VAN-TINE CO.**  
747 Federal St., Davenport, Iowa

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# Arkansas Soft Pine Trim

A wood that meets your needs;  
one that gives the owner the  
harmonious interiors he wants

It is worth much to you for your customers to declare: "Our house is trimmed with Arkansas Soft Pine; the doors do not stick, drawers do not bind, we have no white streaks."

You get the results you want, the effects your customers crave, when you use Arkansas Soft Pine.

## Here is Something for the Contractor

Ready for distribution—the first lot of Arkansas Soft Pine Finished Samples. With your set of five you can show the builders of your town the wonderful wood effects within their reach.

Samples will be sent free  
on request

**Arkansas Soft Pine Bureau**  
608 So. Dearborn St., Chicago, Illinois

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ous sizes and types of equipment, small stationary hand and power batch mixers, a big assortment of concrete block machines, silo machines, sewer and drain tile forms in a wide range of sizes, fence post machines, porch moulds, lawn vase moulds, cemetery moulds and a large assortment of special moulds. We could write volumes on the merits of the individual machines in our line and our suggestion to your readers would be to write us for our catalog, which covers all the arguments for the advantages of our machines.

Yours very truly,

NORTHWESTERN STEEL & IRON WORKS.

By Thorman W. Rosholt, Vice-Pres.

### Artistic Treatment of Cement Surfaces

The rapidly increasing popularity of concrete construction in the way of buildings of all kinds as well as of stucco finished houses has naturally brought up the question of the treatment of the exterior cement surfaces with a view to giving them something akin to artistic effect. Many of the leading paint manufacturers throughout the country have endeavored to solve the problem by making a paint applicable to cement and which when applied would give a durable pleasing exterior finish without showing a painted effect, and which at the same time would be unaffected by dampness or alkali action. Much thought has been given to the matter by Wadsworth, Howland & Co., Inc., Boston, Mass., and has proven by practical demonstration to the satisfaction of leading architects and building contractors that the base of such a compound must be of a concrete nature. The only medium it is said suitable to such a base is one which does not contain an oil affected by alkali and one which would evaporate immediately upon application, leaving the base of the coating an integral part of the surface and not as a skin coating like ordinary paint. The point is made that the Bay State Brick & Cement Coating for cement, concrete, brick and plaster, made by this concern, is manufactured from such a base and does not turn yellow. This cement coating is offered in many pleasing tints and therefore opens an unlimited field of possibilities for the architect, the contractor or the owner who seeks an artistic, pleasing and harmonious effect on these surfaces.

Advertisers' Section.

## The a-b-c of Paint

¶ All paint is composed of one or more pigments and a vehicle or liquid. White Lead is the most widely used white pigment, because it is the only one that can be successfully used by itself for exterior painting. It has a natural lasting affinity for linseed oil. They unite to form a tough, leathery paint skin, which anchors firmly in the pores of the wood and keeps out destroying elements. This film stretches in hot weather and shrinks in cold without breaking.

¶ Carter is the pure white lead of our forefathers, only whiter, finer and more perfectly made. Carter makes the whitest white paint for white houses, and, with the addition of the proper tinting colors, most beautiful and durable colored paints.

¶ Instead of cracking and scaling like paints that contain hard and inelastic pigments, pure Carter White Lead and linseed oil wears gradually, and though soiled by years of exposure, still fills the pores of the wood, resists moisture, prevents decay, and what is important, is ready for repainting without burning or scraping or any other expensive preliminary treatment.

¶ "Pure linseed oil is the life of paint." It absorbs oxygen from the air and becomes hard and elastic. Other oils strike into the wood, entirely or partially evaporate, or never dry at all. There is nothing that is cheaper than pure linseed oil, which can be used safely.

¶ Estimating, Color Mixing, Remedies for Paint Troubles and many other paint pointers are talked about in "The Carter Paint Calculator." The price of the book is 25c, but a copy will be sent free to any contractor or architect.

The Paint Information Bureau

**Carter White Lead Co.**  
West Pullman Station "B" CHICAGO, ILL.

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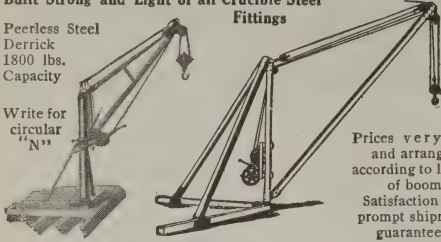


## Introducing the New Sasgen 1 Ton Portable Stiff Legged Derrick

Built Strong and Light of all Crucible Steel

Peerless Steel  
Derrick  
1800 lbs.  
Capacity

Write for  
circular  
"N"



Fittings  
Prices very low  
and arranged  
according to length  
of boom.  
Satisfaction and  
prompt shipment  
guaranteed.

Sasgen Derrick Co., 2053-57 N. Racine Ave., Chicago  
Canada Office: 1 Wabash Ave., Toronto

## About Waterproofing

A  $\frac{3}{4}$ -inch facing of mortar, containing cement, sand and impervite will waterproof any leaky masonry. The facing may be applied inside, and will not be forced off by the water pressure. It will waterproof 5 feet or 50 feet below water.

A typical example of Impervite waterproofing is the pumping pit of the Nepperhan Valley Sewer at Yonkers, N. Y. This pit is 30 feet diameter and 30 feet deep. The bottom is 25 feet below water level. The pit was originally waterproofed with nine plies of tar-and-felt, placed in the center of a 36-inch wall. The tar-and-felt started to leak; it could not be reached for examination or repair except by tearing out the interior wall of concrete 18 inches thick. The Impervite system was therefore decided upon and a  $\frac{3}{4}$ -inch facing was applied in 1912 and has been absolutely successful. I. Hopper Sons, of New York, were the contractors.

Advantages of Impervite for floors: (1) Incorporated in regular top finish. (2) No extra labor involved. (3) Body of floor may be of lean concrete 1:3:6. (4) No double floor needed on top of water proofing, as with membrane. (5) Makes floor dense and very hard. (6) Minimizes dusting.

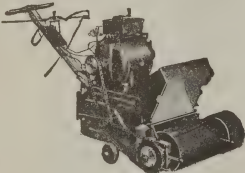
For walls, the facing may be applied inside. It leaves a smooth, dry coating that requires no further plastering or painting. Pure white surfaces are possible and the Impervite will not be affected by steam, chemicals, etc. It has repaired scores of membrane jobs. It saves protecting wall needed for membrane, resulting in less cost, less excavation and more usable space. The waterproofing need not be done until the building is complete above ground level, increasing speed of construction.

The secret of non-cracking stucco is the use of lean mortar. Lean mortar, however, is not waterproof; it cannot resist frost and disintegration. Lean mortar containing Impervite is absolutely waterproof and non-cracking.

Impervite is a paste that mixes easily with water. It has no unpleasant taste or smell. Impervite is not a "mineral soap"—it is an "asphaltic emulsion." One pound of Impervite to the bag of cement is guaranteed to give more waterproofing ef-

Advertisers' Section.

## The AUTOMATIC BALLBEARING ELECTRIC Floor Surfacing Machine



Patented Oct. 15, 1912.  
Made in several sizes.

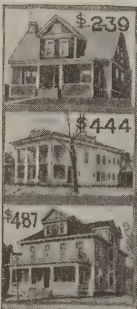
will save you money by rapidly finishing your new or old floors just the way you want them. Self-propelling—you simply guide.

Write today for booklet telling all about the machine, our free trial offer and list of users near you.

WAYVELL CHAPPELL & COMPANY  
Phone Ravenswood 4143

Dept. C, 4845 E. Ravenswood Ave., Chicago, Illinois

## Hot-Water Heating



For  
Old or  
New  
Houses

Get our  
Estimate  
on Your  
Next Job



Profit For Contractors

Our steel boilers and piping systems "cut-to-fit" each job give contractors extra profit and enable them to install the best system made. Ask about our method.

ANDREWS HEATING COMPANY  
1457 Heating Bldg. Minneapolis, Minn.

## FREE TRIAL Rapid Floor Surfacer

Made in  
Several Sizes

M. L. Schlueter  
225 W. Illinois St.  
CHICAGO



PASTE THIS DOME  
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# CYPRESS "The Wood Eternal"

---

is accounted conspicuously fine for the inside trim of the house, especially for the kitchen. It is not "put on the warp" by steam and other forms of moisture, such as too often infest the kitchen. Then the grain is handsome and it takes a most beautiful finish. Why should not kitchens be attractive? Would it not help solve the servant problem? Cypress lasts and lasts and lasts and lasts—and always "behaves."

---

Let our "Contractors' Helps Department" help YOU. . . Our entire resources are at your service with Reliable Counsel. We invite Correspondence with a serious purpose in it.

## Southern Cypress Manufacturers' Association

1212 HIBERNIA BANK BLDG., NEW ORLEANS, LA.

---

INSIST ON CYPRESS AT YOUR LOCAL DEALERS. IF HE HASN'T IT, LET US KNOW IMMEDIATELY

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fect than two pounds of any other waterproofing compound. (This statement is based on official tests made here and in Europe.)

Impervite does not reduce the strength of mortar or delay the set, therefore larger quantities of Impervite can be used and a greater efficiency can be secured.

Waterproofing with Impervite is accomplished easier than with any other compound. Less labor is required. Any good mason, who follows our instructions, can secure absolute waterproofing.

STANDARD PAINT COMPANY.

New York, Boston, Chicago.

### Ideal Block Machines

Hand in hand with the rapid rise of other branches of the cement industry, the concrete products business has been rapidly advancing. The concrete building block meets the demand for a substantial, low-priced building unit and has the advantage over monolithic work, in that it may be inspected before being laid in the wall, and is a complete and thoroughly seasoned building unit, easily handled and very artistic.

For fifteen years we have been manufacturing concrete block machinery and our equipments, which range from the small hand equipment to the most complete power outfit, every operation of which is automatic, are the results of the experience gained during these fifteen years. The result being that IDEAL equipment not only turns out high class products but it turns them out at low cost.

It has been our special desire to build a concrete mixer that would fulfill every requirement of the general contractor. In order to do this it was necessary to design a machine that was compact, and we have succeeded in our No. 7 "Cincinnatus" batch mixer in turning out an equipment that is just a trifle over six feet in length.

Then, the equipment must be light enough to be easily handled, and at the same time stocky enough to withstand the most severe usage. The IDEAL "Cincinnatus" No. 7 batch mixer, complete with engine, weighs only 2,000 pounds. There is no excess weight and yet no part has been skimped at the sacrifice of strength.

The No. 7 equipment will turn out from 50 to 60 cubic yards of thoroughly mixed concrete in a ten-hour day, although many users of "Cincinnatus" mixers say that they get much larger outputs from their equipments than we guarantee.

"Cincinnatus" mixers are manufactured in 7 and 12 cubic foot sizes, loose materials. Each size being equipped in four types—regular with wheelbarrow hopper, regular with batch hopper, regular with power loader and rear discharge paving mixer.

The concrete block business is a paying industry of itself, and yet it may be operated to good advantage by those already engaged in the general contracting and building work in supplying high class concrete stone to their respective communities.

A request for literature directed to the Ideal Concrete Machinery Co., 1312 Monmouth Ave., Cincinnati, O., will be given prompt and courteous attention."

Respectfully yours,

IDEAL CONCRETE MACHINERY CO.

By L. E. Burridge.

### The Use of Metal Lath

Owing to the large amount of metal lath now being used for stucco construction, our SYKES EXPANDED CUP LATH "SELF FURRING" is rapidly gaining in popularity.

There are many reasons for this, but the most important is the fact that this lath is SELF FURRING—that mortar will get a perfect clinch when lath is applied direct to sheathing boards, or where passing over wood studs or other obstructions, making a large saving in this class of construction over metal laths that require furring strips, at the same time securing a better wall. Owing to the formation of this material it reinforces the mortar from all directions, practically making a reinforced concrete wall.

Another important feature is the weight of this material. Our 27-gauge painted weighs 2.8 lbs. per square yard; our 24-gauge painted 3.7 lbs. per square yard. You will find this to be a very heavy and rigid lath. It is not only the best for outside or stucco work, but is equally as good for interior work, owing to its heavy weight and reinforcing qualities.

We also manufacture trough sheet lath



**No. M-815 Flush Sanitary  
Morgan Door**

Plain Red Oak and Birch Veneer one-quarter inch thick. Three sizes carried in stock in Oak and Birch for immediate shipment. One of the most popular and original designs we ever put out.

See Morgan Millwork Handbook

## Our Advertising Creates Business for You

We have just decided on our national advertising of MORGAN DOORS for 1915 and have selected a list of magazines which will reach 2,500,000 subscribers (about 10 million readers) each month throughout the United States—a big percentage of these readers will be *builders this year*. They will know about

### MORGAN DOORS

Get your share of this business by *boosting* MORGAN DOORS to every builder in your vicinity—every builder of a modest home or a mansion is a possible customer. *Make him your customer* and sell him MORGAN DOORS.

Your dealer can supply MORGAN DOORS without delay from our immense stock.

### Morgan Sash & Door Company

Department A-22, CHICAGO

FACTORY: Morgan Co., Oshkosh, Wis.  
Eastern Warehouse and Display:  
Morgan Millwork Co., Baltimore

DISPLAYS: 6 E. 39th Street, New York  
309 Palmer Building, Detroit.  
Bldg. Ex., Insurance Exch., Chicago

## Attention Carpenter Contractors

Keep busy during the winter months laying Wood-Mosaic Floors of Hardwood. Large quantities of our flooring are laid in old houses as well as new. We make all kinds and thicknesses: Wood-carpet, Strips, Plain and Ornamental Parquetry.

We will furnish without charge, upon receipt of accurate measurements of rooms, colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for catalogue and a free copy of our book, "Wood-Mosaic Floors."

Catalogued in Sweet's Index

### Wood-Mosaic Company

33 Hebard St., Rochester, N. Y.

Saw Mill and Flooring Factory: New Albany, Indiana  
Sales Office and Parquetry Factory: Rochester, N. Y.



PASTE THIS DOME  
WRITE TO ADVER-



The tendency towards Parquet Flooring for all types of buildings is so universal that all builders should make themselves familiar with the possibilities of Federal Parquetry.

Carpenters who want to keep busy all winter should go after Parquet Flooring jobs!

With Federal Parquetry Squares and Her-ringbone Strips, you needn't fear price competition—even with ordinary strip flooring.

Federal Parquetry is the very finest quality of thoroughly kiln-dried, uniform, perfectly matched White Oak. Easy to lay; full directions with each shipment. In the usual sizes or special sizes to order.

Write for Special Circular No. 18

### Federal Parquetry Mfg. Company


Offices:  
175 5th Ave., New York

Mills:  
Lexington, Kentucky

Agents wanted wherever we are not now represented

ON LETTERS YOU  
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# The Big Thing— in Wood Shingle Roofing is the Nail

Poor nails, poor roof — Good nails, good roof.

Any wood shingle is good if properly laid and held fast where laid, though some shingles are better than others, but even the best grades of wood shingles make a poor roof when poor nails are used.

Not necessarily a poor roof when laid—but sooner or later (always too soon) the nails begin to rust. Then water finds its way around the nail and rotting of the shingle sets in. Rust induces rot.

After a while the nail hole gets large, the shingles begin to shift—spring a leak—then another—then a wind storm—and off go the shingles. Pick up the shingles and examine them. They are sound except around the nail holes.

## Zinc City Shingle Nails

### Prevent This Rusting

Being pure Zinc they cannot rust—they hold the shingles tight and make a roof that *gives satisfaction for fifty years, and even longer.*

But some architects, contractors and builders prefer our *Pure Copper Nails*. Others like our *Zinc Clad Nails*. We make them too, and we make them right. The quality in our Copper and Zinc Clad Nails is backed by the reputation of our Zinc City Nails.

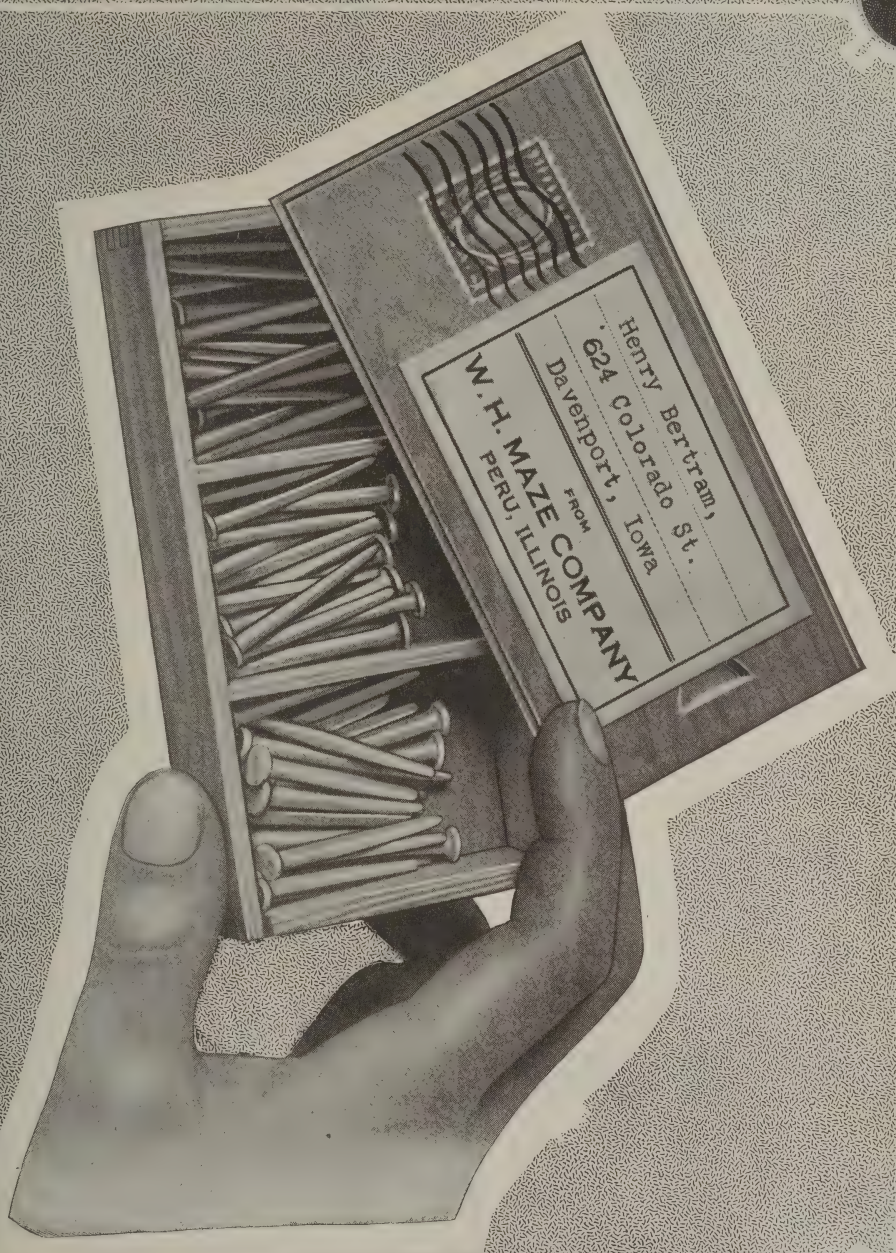
We want you to write for this Free Sample Box (just as you see it on the opposite page.) It is sent postpaid and contains samples of our Zinc City, Pure Copper and Zinc Clad Shingle Nails.

Test these nails out—show them to owners—specify and buy them. If you cannot get them from your dealer, order direct from us. Give your customers a shingling job that will last half a century and longer. It will pay you to do it.

**W. H. Maze Company, Peru, Illinois**









**\$1.00** brings the "Vandor" Vana-  
dium Nail Hammer to you  
by parcel post. Guaranteed  
for a lifetime — will give  
you a new one if  
the one you buy  
proves defect-  
tive.

Drop forged  
from toughest  
Vanadium steel; second  
growth shaved Hickory  
handle; will draw any-  
thing from a headless brad to  
a spike.

No. 21½, 16 oz. Standard; No. 22,  
13 oz. Gen'l Purpose; No. 22½, 10  
oz., Finishing; No. 721½, 16 oz. Ripping.  
Either for \$1.00 and your dealer's name.  
Order today.

**VAN DOREN MFG. COMPANY, Inc.**  
(Vandor Dept.) Chicago Heights, Ill.



**Galvanized Iron  
Cut Nails**

For shingles, slating, boat and wharf  
building, fencing, sheathing and all  
exterior work use

**Anchor Brand Iron Cut Galvanized Nails**  
as they will outlast the best of wood under all  
climatic and weather conditions.

Write for Prices  
**E. & G. Brooke Iron Co., Birdsboro, Pa.**



**Estimators' Price Book  
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By I. P. HICKS

Second Edition, revised and enlarged.  
Over 180 pages. A guide to prices of  
all kinds of building materials, with  
handy rules, tables and miscellaneous  
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**PEARSON'S  
AUTOMATIC SHINGLE NAILER**

*Pays for Itself on the First Job*

Do your nailing faster and on any  
pitch of roof. Wear mittens or  
gloves. Great for use on stained  
shingle jobs.

Made in two sizes—  
BLUE for 3d common No. 14  
gauge wire nails. RED for 3d  
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in. wire nails. Get a nailer  
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**PEARSON MFG. CO.**  
**Robbinsdale, Minnesota**

**\$5**  
Prepaid



## A distinctive finish on any building is a good advertisement for the builder

The first impressions are the  
most lasting and effective.

The finish of the woodwork is  
the first noticed feature of any  
interior. The quality of the finish  
is more important than that of  
the wood itself.

Good wood and good workman-  
ship will be enhanced if the right  
finish is used. Using inferior  
finishes is poor economy when  
your reputation is at stake.

## STICKLEY Stains and Finishes

represent the difference between  
mediocre and *good* for interior  
decorating. They are the identical  
products that have helped in mak-  
ing Stickley Furniture distinctive.

Their cost is moderate. And if  
you wish to use a stain that only  
you in your locality can furnish,  
we will prepare special stains for  
your individual use, if a suffi-  
cient quantity is ordered.

Our Mission Wax is the same as  
we have used on Stickley Furni-  
ture for six years. It covers 25%  
more surface than ordinary bees-  
wax, being in semi-liquid form,  
and produces a waterproof finish.

Write us for complete informa-  
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with you upon any special work  
you have in contemplation.

**STICKLEY BROS. CO.**  
**Grand Rapids - Michigan**

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which by many is preferred for interior work.

If there is any further information you would like in regard to these products, we would be very much pleased to have you write us.

THE SYKES METAL LATH & ROOFING CO.  
Warren, Ohio.

### The Polk Genung Polk Company Fort Branch, Indiana

Without a single exception the construction of monolithic concrete silos is the most paying field for the concrete contractor today. Farmers have decided that the monolithic concrete silos are the kind that renders the most efficient and lasting service and they want such silos badly. The demand is strong and is sure to stay strong.

The one thing that is retarding the building of monolithic concrete silos is the scarcity of contractors who are equipped to build them. It has been only a few years since circular concrete construction was regarded as awkward, expensive, dangerous, unsatisfactory work, the problem of forms and scaffolding being well-nigh baffling. Here is how the POLK SYSTEM solved the problem.

In the POLK SYSTEM machine the entire weight of forms and workmen is carried on a steel centermast carefully guyed to a perpendicular. This centermast is provided with traverse openings adapted to receive a key which supports a widely flanged collar which in turn supports the jacks by which the forms are raised. From a hub which works over the centermast radiate T irons and their tension bar supports, forming a spider which serves to support the inner and outer forms. Each form is composed of separable sections with angle iron edges. The separable sections are connected by threaded studs which pass through aligning apertures formed in the opposite angle irons. The outer forms are bolted together and the inner forms carry a wedge between each segment, the lifting of which allows the form to swing free. A pivotally supported hoisting crane, which may be swung to any part of the wall space, works on the centermast above the hub. Both inner and outer scaffolding is swung from the radiating T irons.

The superior advantages of the POLK

Advertisers' Section.



**T**HE more good tools you use the more good work you turn out, and every "YANKEE" adds to your efficiency as a mechanic. There are now over a hundred "YANKEES" and more coming.



"YANKEE" No. 90, Plain Driver



"YANKEE" Quick Return, No. 130



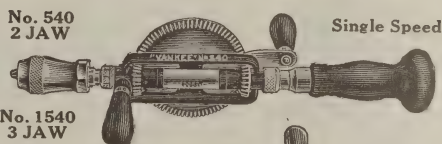
"YANKEE" Adjustable Tension, No. 44



"YANKEE" Push Brace, No. 75



"YANKEE" No. 65 Four Blades



No. 540  
2 JAW

Single Speed



No. 1540  
3 JAW

Two Speed

No. 555  
2 JAW

No. 1555  
3 JAW

BREAST DRILLS

Chucks holds 1-2 diameter  
Length of Drill 18 in.

Our Yankee Tool Book will acquaint you with the entire line. Start a postal after it; we'll do the rest. Your dealer sells the "YANKEE."

**North Bros. Mfg. Co.**  
Department N, Philadelphia, Pa.

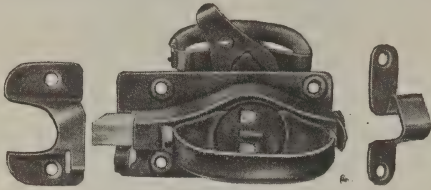
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## Whitcomb Steel Barn Door Latch



Over 13,000 Dozen Sold Last Year

A strong, durable, convenient latch, adjustable to doors of any thickness; will not catch harness. Two large handles permit opening of doors from either side. Each latch provided with two catches to hold door open and closed. Also arranged for use of a padlock.

Albany Hardware Mfg. Co., Albany, Wis.

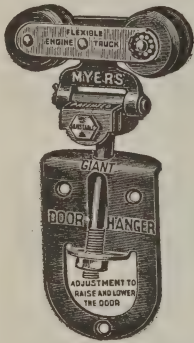
## Caldwell Sash Balance



Does away with weight and cords and **vastly** more durable. Makes sashes work perfectly. Permits greater window space in new work, as box frames are not necessary. May be applied to old windows without altering sashes or frames.

Write for Circular to

Caldwell Mfg. Company  
2 Jones St., Rochester, N. Y.



## MYERS GIANT

and New-Way  
Adjustable Tandem  
Door Hangers

PATENTED

For Tubular Girder Track

Are adjustable up or down, and in or out. Trolley Wheels are heavy turned steel, revolving on steel roller bearings, and run inside the tubular girder track. Not affected by rain, sleet or ice. Write for descriptive circulars and prices.

F. E. MYERS & BRO.  
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## Builders' Hardware?

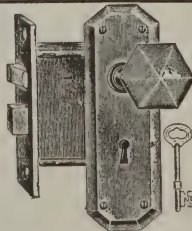
**Sure we got it!**

And in the right designs and finishes.

Write for free catalogue and net price list for contractors and material men. Easy to select and buy from.

We do not sell to carpenters or contractors in Cook County, Illinois.

REHM HARDWARE COMPANY  
1503 Blue Island Ave., Chicago, Illinois



**50c** for this  
Lock Set

No. 9155 in Dull Brass  
Finish

SYSTEM machine lie in the facts that it is practically all steel, that all the weight and the alignment are cared for by the steel centermast, and that there is at no time any strain on the green wall. These things are true of no other machine on the market today. In the centermast feature lies the startling success that the POLK SYSTEM business has known. The handsome profits lying in silo construction have in the last two years attracted many engineers and contractors from other fields, but as yet the supply of concrete silo contractors is wholly inadequate.

The POLK GENUNG POLK COMPANY will be glad to answer any questions you may have in regard to circular concrete work.

H. T. GENUNG,  
Secretary-Treasurer.

## Packard Mixers.

The catalogs that we are mailing out show a line of very neatly designed, sturdy, compact, mixers.

The Packard Mixers seem to be about the same design as the Popular and Successful Paving Mixers—and one of the interesting features is that the mixing action of this Packard mixer is the re-mix mixing action usually shown on larger mixers.

The catalog ought to be of great interest to the man who has country work to do, as our mixer tracks in standard wagon tracks, and only weighs from 700 lbs. to 1,750 lbs. It also shows that we are wise in designing them with the low loading feature—in fact they are among the lowest loading mixers made—the wheelbarrow hopper is only 30" from the ground, about knee high—that is low, isn't it? We equip our mixers with a low loading hinged platform only 22" from the ground. The measuring batch hopper, which increases capacity about 25 batches a day by the same number of men is only 42" from ground.

You will notice in our catalog that the Packard Mixer has plenty of power, having a 3 h. p. gasoline engine, with a 4½"x6" cylinder. The engine is housed with a steel automobile housing. The specifications show the steel construction in all our mixers, which makes them well built, and very

Advertisers' Section.

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# Accuracy in Long Measurements

When you are taking long measurements, don't stop to use a rule with its possibilities for error, or a cloth tape which may stretch, but get your distance quickly and exactly by using a

## Starrett Steel Tape

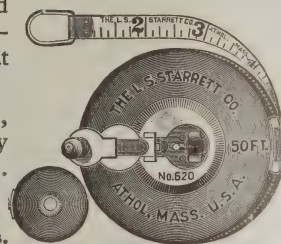
You can rely on your measurements when you use a Starrett, because Starrett tapes are carefully graduated and marked so as to prevent error in reading. The convenience of handling a Starrett and the time saved will be well worth the price of the tape.

Starrett tapes are made in a wide variety of styles and lengths. There are little fellows 3 feet long for pocket use and big ones 100 feet long. Some are contained in leather cases, some in nicked steel cases, and some come on handy reels. The new patent push-button tape shown here is a great convenience in opening the handle.

Our free catalog No. 20M shows the styles, sizes and prices for each. You can buy Starrett Tools at all good hardware stores.

**The L. S. Starrett Co.**

*World's Greatest Toolmakers*      **Athol, Mass.**



42-367

## The Ideal Saw for Interior Finishing

# DISSTON No. 77

("MECHANIC'S OWN")

- ☞ Cuts rapidly and smoothly. Fine for cutting mitres.
- ☞ Specially ground to cut without set in dry, seasoned wood.
- ☞ The smooth cut of the No. 77 has led to its extensive use by cabinet makers—planing joints before gluing unnecessary.
- ☞ Service in dry, seasoned wood warranted.
- ☞ Refined Spring Steel Blade, Apple Handle Polished, Brass Screws.

Get Our "Handsaw Booklet"

**Henry Disston & Sons**

Incorporated

**Philadelphia, U. S. A.**



Registered U. S. Pat. Office



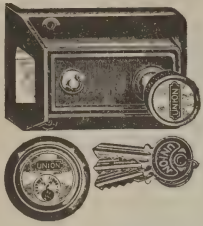
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## No. 0132 Cylinder Night Latch

Value \$1.25  
Special Sale **90c**

Postage Paid

Send for our money-saving hardware catalog

COBB, WHYTE & LAEMMER CO.

Dept. 7 177-179 No. Clark St., Chicago, Ill.

strong. The combination hoist and mixer feature is a clever idea.

The catalog shows a hand mixer also, which is designed with the mixing action and this mixer really is a fine thing as it gives a man the same mixer as the power mixers, only without power.

The fact is any man interested in mixers ought to get our catalog. We have a very liberal trial proposition.

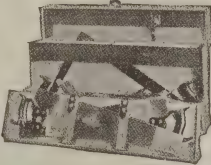
CONTRACTORS MACHINERY CO.,

Keokuk, Iowa.

## INDESTRUCTIBLE Carpenters' Tool Cases

Stronger than any wooden chest, much lighter, holds tools better, much easier to carry. Same shape as a suitcase when folded and carried like one.

Made of 3-ply veneer, covered with heavy canvas and painted. Edges and corners are bound and reinforced with steel. Two brass catches and locks. Contains a place for every tool. Two sizes—31 in. for 26 in. saws, 33 in. for 28 in. saws. Will last a lifetime. Write for booklet and prices now.



WEDELL & BOERS

157 Jefferson Avenue, DETROIT, MICH.

## C. E. Jennings' Carpenters' Tool Cases

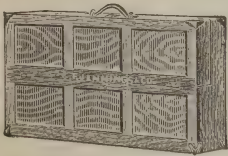


Illustration of Tool Case No. 35

Write for circular of our Little Wonder Tool Kit No. 60

Largest Tool Chest Line  
"Made in America"

C. E. JENNINGS & CO.

Sole Manufacturers 71-73 Murray St., New York



## THE ENDEBROCK TOOL CHEST

Suit case shape, compact, convenient and keeps the tools in good shape. Size 34x6x14½. Strongly constructed and steel covered. Space for four saws, 16" Tongue Square, Iron Smooth and Jack Plane, etc. Send \$6.00 and your dealer's name; more details first, if you wish.

Dealers write for particulars of our great agency offer.

F. Endebrock Trunk Co., St. Joseph, Missouri

## Apartment Building Hoist

A new device that will undoubtedly prove a boon to the apartment building and residence builder is a small hoist that has recently been invented by a contractor actively engaged in this work.

It is quite an innovation in that it is very simple, quickly installed, can be sold at a very reasonable cost and will eliminate the large and expensive hoists now being used for this work.

This new hoist, which can be operated in an opening 24x54 inches, is built on an elevator frame that travels in channel guides. It can be operated either by hand gear, straight away pull of a horse, or line can be led to drum of hoist or mixer.

Special carts will be furnished, one style for brick with a capacity of 45 brick and the other for mortar with capacity of two and one-half hods, number of carts depending on number of laborers to be kept busy. These are one-wheeled carts that can be wheeled through doorways direct to the work. Can also be used to hoist stone sills and steel girders, etc.

The great advantage of this small elevator is the fact that it is not necessary to leave a large opening through the floors and doorways, and in many cases it is only necessary to spring one joist temporarily to provide space for it, or on short spans leave out one. Also it can be shifted to floor above and made ready for operation in fifteen minutes.

Further particulars of this outfit will be furnished on request.

Very truly yours,

H. B. SACKETT SCREEN & CHUTE CO.,

1689 Elston Ave., Chicago.

Advertisers' Section

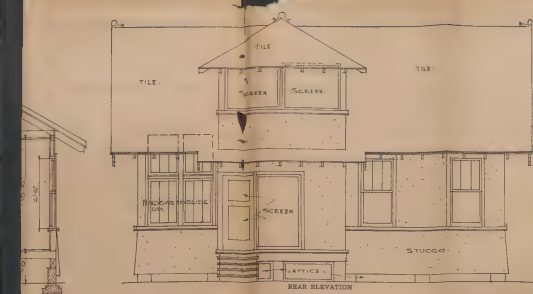
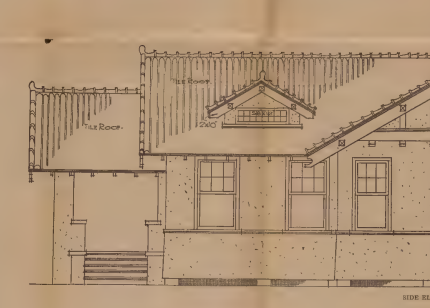
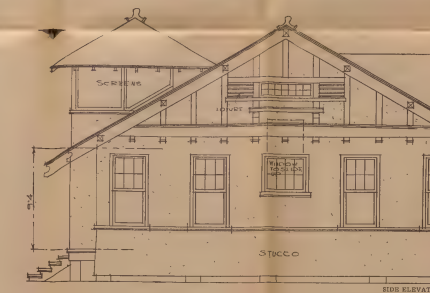
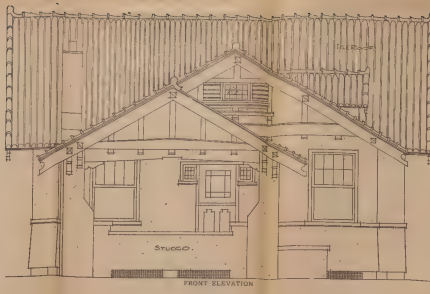
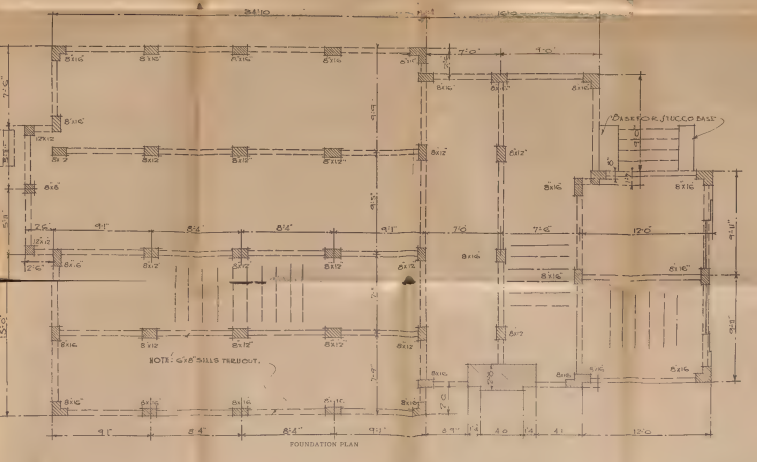
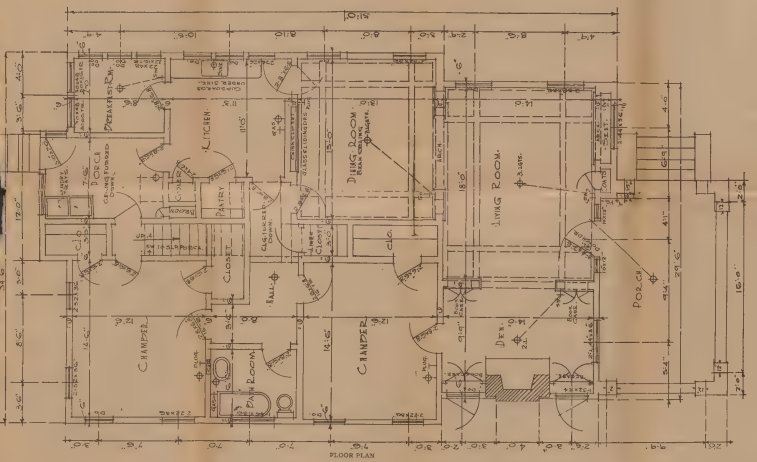
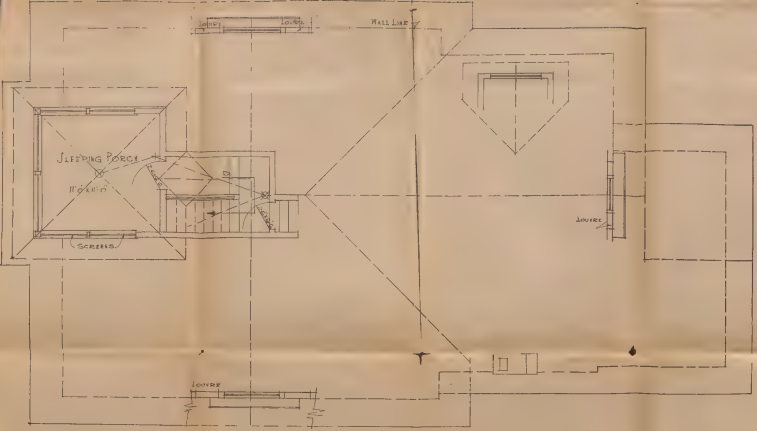
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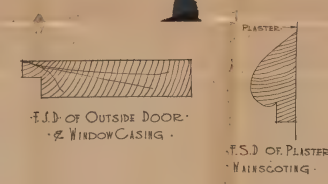
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UNITED STATES

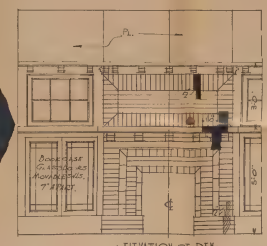




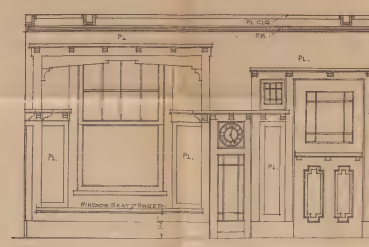
1/4" SCALE DETAIL OF BREAKFAST ROOM WINDOW



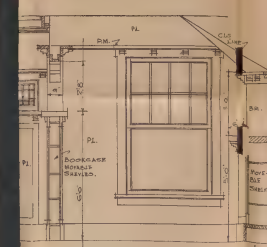
1/4" SCALE DETAIL OF OUTSIDE DOOR & WINDOW CASING



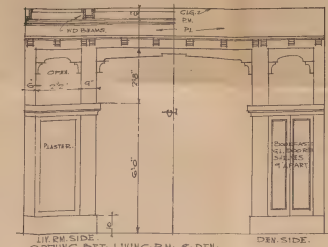
ELEVATION OF DEN



ELEVATION OF LIVING ROOM



ELEVATION OF DEN



1/4" SCALE DETAIL OF OPENING BETWEEN LIVING ROOM & DEN

# SUPPLEMENT TO THE NATIONAL BUILDER

JUNE, 1913  
NATIONAL BUILDER DESIGN NO. 306, A PLEASANT FLORIDA BUNGALOW  
Scale for floor plans and elevations, 1 inch equals 4 feet. Details, 1/4 inch equals 1 foot and 1/2 inch for full size.  
FOR DESCRIPTION AND ESTIMATES, SEE PAGE 33  
This Bungalow is Shown in Colors on Front Cover

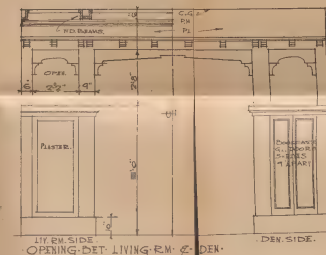
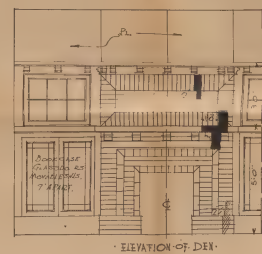
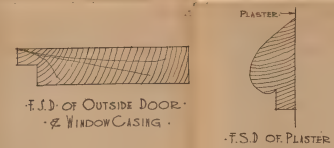
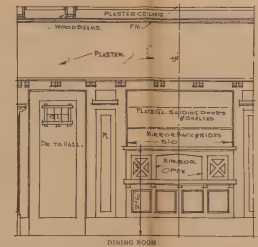
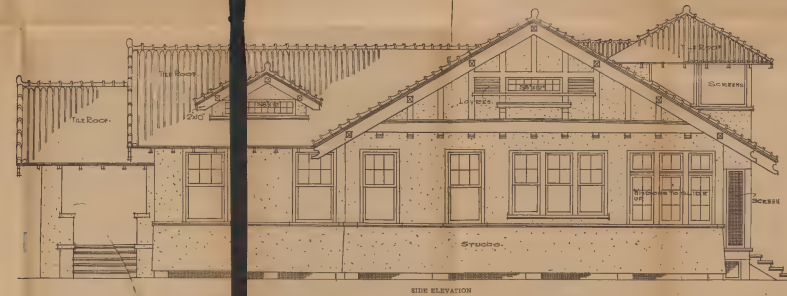
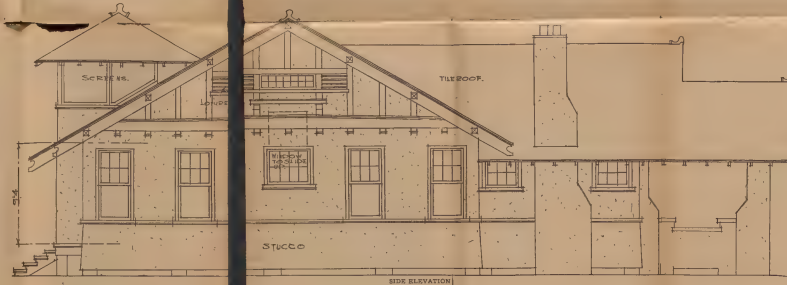
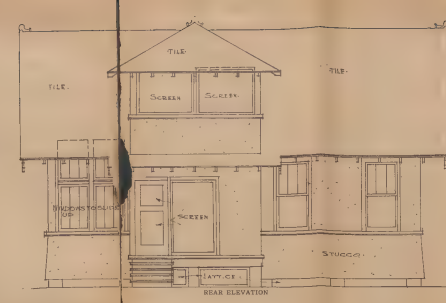
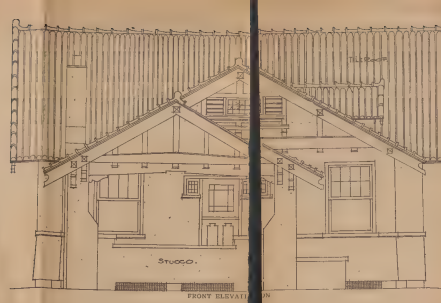
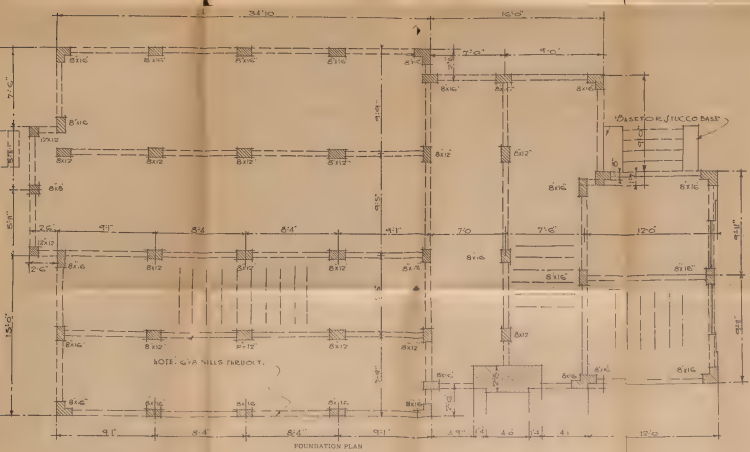
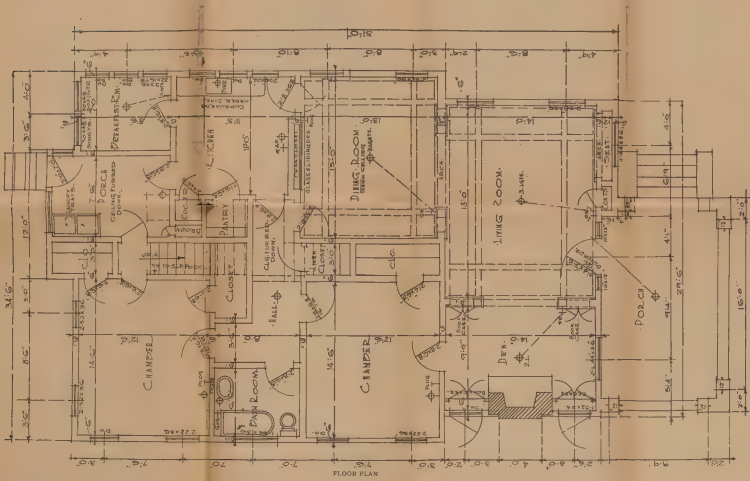
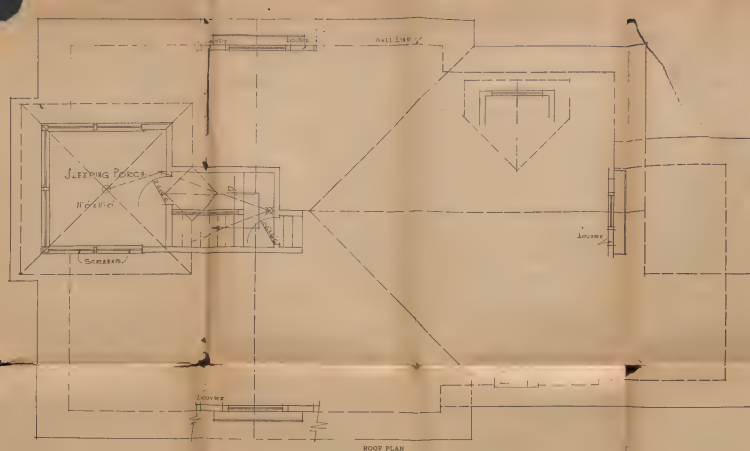


Pl.

PLASTER.

IV. RM. SID  
PENING. F





# SUPPLEMENT TO THE NATIONAL BUILDER

JUNE, 1915

NATIONAL BUILDER DESIGN No. 396, A PLEASING FLORIDA BUNGALOW

Scale for floor plans and elevations, 1 inch equals 4 feet. Details, 1/2 inch and 1/4 inch to 2 feet and full size

FOR DESCRIPTION AND ESTIMATE, SEE PAGE 35

This Bungalow is Shown in Colors on Front Cover





## GOODELL MITRE BOX

Made of Steel ——— Cannot Break



Send for New Circular E

**First in Quality  
& Improvements**

New STEEL BOTTOM PLATES with ANGULAR SERRATURES to prevent the work from slipping, and many other special features.

**GOODELL MFG. CO.,**  
GREENFIELD - - MASSACHUSETTS

## The Iowa Batch Mixer

In designing and perfecting the Iowa Batch Mixer, we have constantly consulted builders and cement contractors, with the result that we have a mixer just as they want it built, and it does just what they want a mixer to do.

It will thoroughly mix a batch of three cubic feet in one minute, thirty-five to fifty yards per day by power operation. It is a pigmy in size and price, a giant in strength and efficiency. No mixer will last longer than the bearing parts, therefore we give special attention to hub construction. The hubs are all carefully machined, and fitted with two sets of roller bearings, and so protected that sand or cement cannot get into the rollers, which makes it light running and adds greatly to the life of the mixer.

The bowl is cup-shaped in the bottom, leaving no sharp angles or corners for cement to collect in and clog the machine, and it is easy to keep clean.

The solid curved yoke is extra strong, and gives the mixer a perfect balance, making it easy to tilt when dumping the mixture.

The whole machine is supported by sturdy legs, and well braced. No useless parts, but every part has its use and will meet every demand made upon them up to capacity, and the Iowa Batch Mixer is guaranteed to give satisfaction.

IOWA FOUNDRY & MFG. COMPANY,  
Ft. Dodge, Iowa.

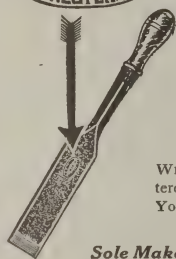
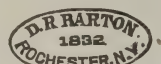
## TRADE REVIEW

### Mechanics' Tool Chests.

It would be very fine if we could sit in our shop and have the work come to us. Unfortunately we cannot always work that way, but we must get out on the job and carry our tools from place to place. We require therefore, some kind of a tool-chest to keep them from getting lost as well as to keep them from tearing the clothes of the other passengers on the crowded street cars.

The F. Endebroek Trunk Co., St. Joseph, Mo., have designed tool-chests and carrying cases for a variety of purposes. The cases can be carried anywhere without danger of loss or damage. Their circular showing the various styles, sizes, and prices will be

Advertisers' Section.

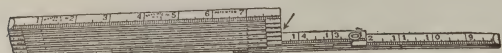


## What the Sterling Mark is to Silver—

the BARTON trade mark  
is to Carpenters' Tools—  
*the highest in quality and the  
highest in price.*

Write for book "True Stories" and an interesting article on how our tools are made. You'll know then why our tools cost more.

**Mack & Company**  
Sole Makers Brown's Race, Rochester, N.Y.



## Be An Agent for a Rule Every Carpenter and Builder Needs

Improved Interlocking Fool-proof *Master Slide Rule* gives inside as well as outside measurements of doors, windows and everything else instantly and accurately. Strongly made, rust-proof and designed to last many years.

Price 15c per foot, in sizes from 4 to 8 foot lengths. Order a trial rule.

Anyhow learn about our agency proposition. Circular B tells.

**DAHL MANUFACTURING CO.**  
51B East 42nd Street New York City

1853



1914

**61 Years of Tool Making Behind  
Buck Bros. Products**



Our line of tools includes Gouges, Plane Irons, Chisels, Drawing-knives, Nail Sets, Screw Driver Bits, Carving Tools, etc. Our reputation guarantees them all. Catalog shows them all. Write for it.

**BUCK BROS. : : MILLBURY, MASS.**

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## Saws of Efficiency and Satisfaction Bear the Name

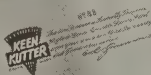
# KEEN KUTTER

No. K88  
Price \$2.00  
26 inches

Made of best steel, properly filed and set. Perfectly balanced—will not "buck" and jump, but saw true and fast with little effort. Sold for over 45 years under this motto:

*"The Recollection of Quality Remains  
Long After the Price is Forgotten."*  
Trade Mark Registered. —E. C. SIMMONS.

Send for our Home  
Furniture Design Booklet  
No. M 976.



If not at your dealer's, write us.

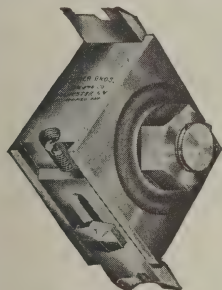
**SIMMONS HARDWARE CO.**

St. Louis New York Philadelphia  
Toledo Minneapolis Sioux City Wichita



**Huther Dado Head**

Pat. Nov. 29, 1892—July 19, 1910



**Cutter Head**

Pat. Dec. 30, 1913

## Make Your Saw Table Do More Work

A Huther Dado Head or Cutter Head will more than double the output of your saw rig. The Dado Head can be used for a variety of joints and fits any saw rig. It cuts perfect grooves, any width, with or across grain and has a simple no screw adjustment.

The Dado Head is sent on trial and may be returned at our expense if not satisfactory.

The Cutter Head can be used on an ordinary saw mandrel to cut regular mouldings, window sash, stops, stair treads, cove moulding, etc. Special knives of any desired pattern made to order. This Head is of special design and runs like a solid cutter.

We also make special saws for making slotted joint for window sash and many other special cutters.

Write us today.



This slotted joint for window sash was cut with a combination of Bevel Face Saw and Patent Tooth Matcher Cutter.

Several joints and method of cutting in one operation are shown in our new No. 34 catalog. Write for one today.

**Huther Bros. Saw Mfg. Co.** 1105 University Avenue  
ROCHESTER, N. Y.

## A BIT OF UTILITY

Guided by its circular rim—instead of its centre—the Forstner Labor-Saving Auger Bit will bore any arc of a circle, and can be guided in any direction. Doesn't matter how hard the wood is, no consequence

whether it is full of knots, or the grain awkward to negotiate. The Forstner Bit works with equal smoothness under any condition and leaves a true polished surface on every job.

## UNEQUALED FOR DELICATE WORK

Supersedes chisels, gauges, scroll-saws, or lath tools combined, for all kinds of delicate work. Cabinet and pattern makers and carpenters are enthusiastic because they do more work than other bits and

cost no more. We can offer something special in the matter of price on sets packed in a sensible box. Send today for particulars and catalog.

**THE PROGRESSIVE MFG. CO., Torrington, Conn.**



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## You Save Time and Money



and, in addition, you have the satisfaction of knowing that your work is as neat and durable as possible if you use

### Kees Metal Building Corners

Make neat, weather-proof corners without cost of cutting bevels. Used with lap-siding and almost invisible when painted. Write today for free samples, prices and particulars.

**F.D. KEES MFG. CO. BEATRICE, NEB.**

Box 811

## Build For An Income



Buy a Plan Book of Flat Buildings and plan an income in your old age. Our book gives you ideas from two-family flats to twelve families, and our prices are reasonable.

First edition (right off the press) . . . 50c  
Also a book for residences . . . 25c  
Both . . . 65c

**H. COOK & COMPANY**

720 Ashton Bldg., Grand Rapids, Mich.

## Wanted Everywhere

Reliable Carpenters, Builders  
and Material Men

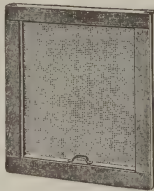
## To Make Big Money

taking orders for our made-to-measure "Fly Screens and Screen Doors" for dwellings and porches.

### GET OUR AGENCY PROPOSITION

We use the best grade of wire, black enamel, galvanized, pearl, peerless and copper bronze, fastened by the improved **Standard Shoulder Strip Method**, makes the wire drum tight and firm, cannot sag or pull away.

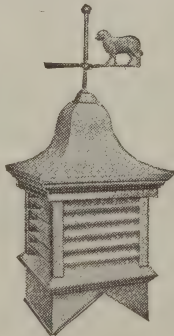
Standard Screen Co., 1846-58 Hastings Street, Chicago



## A Gale Cupola In Your Plans

will mean fresh air without draft in the building. Heavy galvanized iron construction—look good—moderate priced. Storm and bird proof. Write for trade terms

Galesburg Sheet Metal Works  
142 So. Prairie St., Galesburg, Illinois



sent by the manufacturers to those of our readers who request it. Our readers should at the same time give their hardware dealer's name.

### New Router Plane a Success

A fine little lock and butt router plane has made its appearance on the market, and is now being sold by many of the leading hardware dealers. It is known as the Green Gauge Lock and Butt Router Plane, and its purpose is to make work a whole lot easier for the carpenter in setting locks and hinges.

The tool gets its name from the green enamel used in finishing. It is substantially made from malleable iron and has no intricate parts to vex the carpenter or take much time in adjusting. This little router plane is a handy size to carry around in the tool kit, and will cut out a seat for lock or butts to a uniform depth below the surface in one-half the time usually required by the old chisel method.

The use of this tool does away with the uncertainty of the butts setting just right. It leaves the seat so smooth that it is not necessary to true up the butt with a paper pad.

The "Green Gauge" has extensions so that large butt seats can be routed as easily as small ones. The work is as clean as a whistle, and does not require any chiseling. When you buy the router plane, you are assured of accuracy, speed and unlimited convenience in the line of work it is intended for.

The manufacturers, I. N. Sutton & Sons, 220 Poplar street, Atlantic, Iowa, are giving one of these planes free to one carpenter in each community. We are not familiar with the conditions of this free offer, but suppose that the man who writes them first gets the free plane. We suggest that you send them a postal card immediately, asking for particulars about the Green Gauge Lock and Butt Router Frame and tell them you want to take advantage of their free offer.

### A Convenient Clothes Post

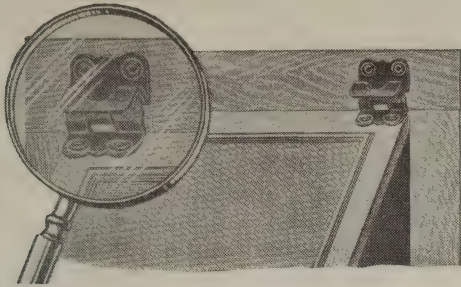
Another convenience has been added to the growing list of things that save time for the builder. This time it is a steel clothes post on which the clothes line can

Advertisers' Section.

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### It Spells Safety— Durability and Economy

Screen cannot be jarred out of place. Makes sagging impossible. Eliminates the necessity of removing screens when washing windows. Has a two-fold purpose—can be used to hold storm sash in winter.

Furnished in either Japanned or Galvanized Steel or Solid Brass. Give your customers the very best by insisting on

#### WATROUS SAFETY SCREEN AND STORM SASH HANGER

Its simplicity of construction makes it easy to hang. Saves half the carpenter's time. Only tool a hammer. Barbed car nails used in place of screws.

Cost less—last longer—give better service.

At your dealers. If yours don't handle it write us direct.

**FREE** Sample. Write for it today also literature on other time-saving hardware specialties.

*Our Wrought Steel Butts can't be beat—  
Ask about them*

**Watrous-Acme Mfg. Co., Des Moines, Ia.**  
Chicago Sales Office :: 180 North Dearborn Street

Look there at that  
instantaneous  
speed shift



Simply a  
Turn  
Shifts  
Speed

The convenience of this feature is still further enhanced by the simple and effective ratchet shown on the crank handle. This ratchet will be found of great assistance when working in cramped corners or on a delicate job.

## MILLERS FALLS HAND DRILL No. 1980

Side grip handle is removable and tool is thus made easier to carry. The main handle is hollow and provides a receptacle for holding twist drills up to and including the largest size within capacity of the chuck.

This drill is equipped with the Millers Falls Star Chuck which has no equal for holding and centering. The jaw springs of this chuck are protected from injury and guaranteed not to get out of order. Steel pinions and shifting devices also protected by being enclosed.

All these features, some of them exclusive, tend to make for faster, better work.

If your tool dealer does not stock it he will be glad to order it for you. Send for pocket catalog showing complete lines.

Ask your dealer to show you these other Millers Falls Tools. Bit Brace 892 and Extension Bit Holder 6. New tools combining many improved features and new prices that are especially attractive.

**MILLERS FALLS  
TOOLS**



**Millers Falls Co.**  
Millers Falls, Mass.

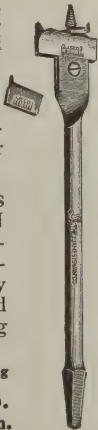


### Good Tools Make Work a Pleasure

☞ Good woodworking tools save more time, enable better work and will last considerably longer than tools made to sell simply on a low price basis. The carpenter who uses inferior tools is working under a big handicap.

☞ By good tools we mean SWAN tools, which embody the high quality developed by over one hundred years' manufacturing experience.

Write for free complete catalog  
**The James Swan Co.**  
Est. 1810 Seymour, Conn.



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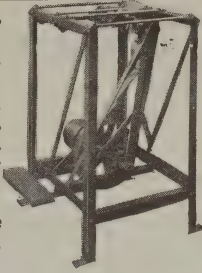
## Miller's Sliding Arbor Cut-Off Saw

Is best for small accurate sawing—operates by treadle—leaving both hands free for material. Cuts up to  $1\frac{1}{4} \times 8$ " stock.

Write now for Circular and Price

on this and on my screen wire stretcher, clamping bench and laying out table, moulding mitre cutter, etc.

A. N. MILLER, 750 38th St., Milwaukee, Wis.  
Manufacturer of special Sash and Screen Making Machinery



be strung. It's a heap more sightly than the old wooden posts that spoil the look of many yards. And the best part of it is, it can be taken down and put out of the way until the next wash day comes around.

Sockets are driven into the ground and when the posts are to be used, they are slipped into the sockets, which make rigid anchors. When the post is taken down a cap is placed over the socket hole so dirt or water cannot enter. A lawn mower will run over the sockets without interference.

These clothes posts are made of galvanized steel tubing  $1\frac{5}{16}$ " in diameter and stand  $6\frac{1}{2}$ ' above the ground. They are filled with concrete, which adds to their rigidity and prevents buckling or bending.

An adjustable hook is fitted to the post. The line is fastened to the hook and the clothes hung at a convenient height; the hook is then pushed up to the top of the post and the tension holds it there.

The Re-Move-Able Steel Clothes Posts are more sightly than any other. They take up no room; save the cost of digging holes; are cheaper than wooden posts. With these facts in mind our readers should urge their clients to use the Re-Move-Able Clothes Posts. A neat sum can be made by specifying and installing them. Get a complete description of the post from the manufacturers—the Milwaukee Steel Post Co., 500 Iron Bldg., Milwaukee, Wis. Ask them how much you can make on every set you sell. A postal card request will bring you some money-making ideas.

### Comfort in the Home

A comfortable home is the first essential to contentment. No locality can claim a monopoly in this, and herein lies the value of careful planning and constructive design.

A house may be as elaborate as the means of the owner will permit, but if the essentials of this design and construction are lacking the house is a failure as far as contentment is concerned.

Messrs. E. W. Stillwell & Co., Architects, 4381 Henne Bldg., Los Angeles, Calif., have given a great deal of time and study to the planning of Little Bungalows, West Coast Bungalows and Representative California Homes. In offering plans of these buildings to our readers, they have a most

Advertisers' Section

## HOME PLANS

Fifth Edition

Coin or 50c Stamps

Residences \$1,000 to \$6,000  
Cottages \$1,000 to \$6,000  
Bungalows \$500 to \$2,500

All in one book



Complete blue print drawings, working details, specifications, and list of material at reasonable prices. (Also plans from your own ideas.) Our Service Department is organized to assist all those who contemplate building. Let us make your building plans.

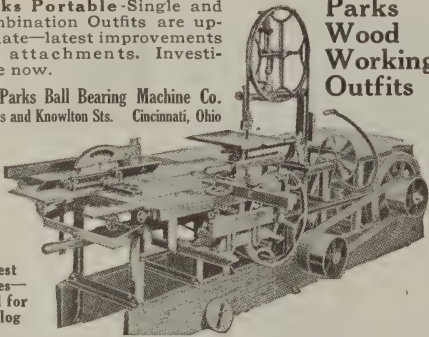
JENS C. PETERSEN, Architect

815 State Bank Bldg., Traverse City, Mich.

Parks Portable—Single and Combination Outfits are up-to-date—latest improvements and attachments. Investigate now.

The Parks Ball Bearing Machine Co.  
Fergus and Knowlton Sts. Cincinnati, Ohio

## Parks Wood Working Outfits



Lowest Prices—Send for Catalog

## An Opening for a Mortise Lock Can be Cut in Two Minutes by using the Miller Door Mortiser

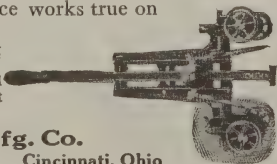
Little labor is required, and a perfectly true job is assured. Makes no difference what thickness the doors are, the device works true on them all. Complete with five cutters, covering locks from  $\frac{3}{8}$  inch to  $1\frac{1}{2}$  inches thick. A real time and labor saver. Sent subject to trial.

A. W. Miller Mfg. Co.

Riverside, Calif.

Cincinnati, Ohio

Our Butt Mortiser and Rule Gauge for 75 cents. Postpaid



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# Diamond Expansion Bolts

For fastening all kinds of material  
to brick, stone or concrete—

**Quickly  
Securely  
Positively**



*"They Hold as Long  
as the Wall Lasts."*

**Diamond Expansion Bolt Co.**  
90 West Street - New York

# Every Carpenter Needs This Tool

Save your valuable time—save expensive delays—and do a far better job than you ever could by the old way—by using the



# Green Gauge Lock and Butt Router Plane

It reduces the labor one-half in setting locks and butts. Can be set by lever to any depth, and will cut out seat for lock or butts to a uniform depth below surface, thus avoiding the uncertainty of setting butts. Has extensions to enable workmen to rout out large butt seats as easily as small ones. Eliminates the necessity of removing butt to put paper under it, or trimming front and back with chisel. Leaves seat as true as face of jamb. Its use means convenience, speed and accuracy.

## GET ONE FREE

Believing that "one in use" is worth two salesmen, we will give one free to a carpenter in every community—we know his recommendations will sell us several more. Write us about this free offer. Price of this tool is \$1.25 postpaid. Money back if you want it. Order one today.

**I. N. Sutton & Sons, 220 Poplar Street, Atlantic, Iowa**



# SAND'S ALUMINUM LEVELS

## WILL NOT WARP

Sand's Aluminum Levels are light, strong and durable. They will not warp, split or rust. Nothing to work loose or get out of order. Easy to handle. Need no adjusting. Made in 18", 24" and 30" sizes for Carpenters and 42" length for Masons. We also make a high-grade line of wood levels.

are honestly made of very high-grade aluminum specially prepared for this purpose. The finish is ideal and the greatest strength is placed where most needed. All unnecessary weight is left out. The plumbs are the best that careful experience can make. Each level is fully tested before it is offered for sale. You can count on Sand's Levels being perfect.

## ASK YOUR HARDWARE DEALER

to show you Sand's Levels. If he does not sell them let us know, and we will send you a circular showing full size view of our 24" Aluminum Level and ½ view of the 30". Just like seeing the actual levels.

**J. SAND & SON, 1023 Rivard St., Detroit, Mich.**

## Best Level To Use In Dark Places

The plumbs at each end and the double center level make it readable in any position and at arm's length. Pick it up any way. It is always in position. Vials covered with heavy plate glass which keeps out water, dust and dirt. A Sand's Aluminum Level will last you a lifetime.

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## THE NORTHWESTERN TERRA COTTA CO.

Nor too Small to Receive  
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Office and Works:

2525 CLYBOURN AVE., CHICAGO, ILL.

unusual form of guarantee which should be of interest to everyone.

Messrs. E. W. Stillwell & Co. do not confine themselves to the stock plans which they have prepared, but they take great pride in their special plan department, in which they are prepared to make plans for any desired location and to meet any specific requirements. They will be glad to hear from anyone who is interested in modern and complete plans for homes.

### On the Level

Few buildings are erected without careful thought and planning. How essential therefore that the actual construction be started right and kept right through the entire progress of the job. The convertible level made by the A. S. Aloe Co., 613 Olive St., St. Louis, Mo., will enable the contractor to lay out buildings, locate piers, level up foundations, walls, etc., line up shafting, lay out ditches, streets, sidewalks, and, in fact, determine lines or levels correctly wherever such work is required.

As many contractors and carpenters believe that the use of a level requires a university education or the practice of some of the black arts, the A. S. Aloe Co. are prepared to send their complete instruction book free on request. This will show the contractor how simple the use of their level is and how he can use it to advantage in his work. It will also give the complete details of a plan by which a level can be obtained at practically no cost.

### Metal Lath by Weight.

The Associated Metal Lath Manufacturers during its four years of existence has made sincere efforts to find by research and field investigation fundamentals that govern the use of metal lath.

The earnest desire of the metal lath manufacturers to get to the bottom of things is well evidenced in the fact that they have turned over to the National Bureau of Standards at Washington, the investigation of the corrosion problem as affecting metal lath. Possible corrosion is recognized by architects and engineers as serious as regards all iron and steel material that goes into a building, whether it be gas or water pipe, structural members, roofing or metal lath, and the reports of the Bureau of Standards following their experiments and re-

Advertisers' Section,

## Boss Carpenters

and Journeymen Carpenters have many a week with no work. Why not attach to Chairs and Furniture Evergrip Gliding Casters? We furnish plenty Free Demonstrating Sets.

### HERE'S OUR OFFER

Send your business card or letterhead and we will send you 100 sets. Also 25 FREE Demonstrating Sets. Sell the 100 sets for 10 cents a set. Your profit \$6.50. Send no money till all are sold. Then order more. With each lot we send 25 Free Demonstrating Sets with each 100 sets. If the Boss Carpenter can't spare the time, arrange with your journeymen and divide profits. Thousands can be sold. The public will appreciate the Free Demonstrating Sets and buy 6 to 20 sets. The good will of the people thus secured may result in carpentry work for the boss. Either way you win. We have over 150 Carpenters doing well with this proposition. Now Carpenters go to it!



STRANSKY MFG. CO., Dept. R. 20 Warren Street, NEW YORK



### Miller's Bungalow Plans

are used exclusively in our book, "Bungalows and Other Things," which contains photographs and floor plans of many artistic homes that can be built for \$1,500.00 up. Get this book, it is the best of its kind on the market. Pick out the house you want and we will furnish the plans and specifications for \$5.00 to \$15.00. The book is receiving high praise from contractors and builders.

Price \$1.00

Burd F. Miller Co. 25 Brandeis, Omaha, Nebr.

## Investigate — Consider — Buy The A. B. C. Dumbwaiter

You get an A1 machine made of carefully tested grey iron castings.

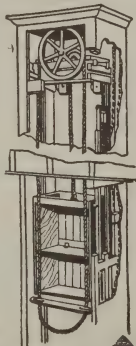
AND you get the result of years of thorough experience, such as double leading sheaves or pulleys; they take up the noise.

Every A. B. C. Dumbwaiter is equipped with the latest improved King Check for holding load at any point.

Send us size and depth of well hole and we'll gladly quote you

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19-21 Kingsland Av., Brooklyn, N. Y.



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## Build For Comfort A Stillwell California Bungalow HOME



Our books show 132 practical 1 and 2 story plans adaptable to any climate.

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50 Ideal Homes—\$1600 to \$6000—Price 50c

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"Little Bungalows" 31 Perfect Little Homes—\$300 to \$1700—Price 25c

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E. W. STILLWELL & CO., Architects  
4382 Henne Building Los Angeles, California

## GOING TO BUILD? LET ME HELP YOU



I've planned hundreds of charming, convenient, livable houses.

**My Book 50c**  
contains choice plans,

Exteriors and interiors; complete descriptions and cost of these most modern homes that can be built for from \$1,000 to \$8,000 in brick, cement and frame. Get my practical book (including my 7 design pamphlet;) sent prepaid for 50 cents.

C. M. ESSEBAGGER, Architect, Houseman Bldg., Grand Rapids, Mich.

## Carpenters—

### Here's An Opportunity to Make Money in Winter

Here's something right in your line—a Chemical Closet that you can sell to a home builder cheaper than a wooden privy and make a bigger profit for yourself. Here's something you can sell at odd times or turn over to your son or your foreman to sell.

## RO-SAN Chemical Closet



An absolutely sanitary, odorless indoor closet that may be placed anywhere in the house. Abolishes the germ-breeding outdoor vault. A comfort and a convenience where there is no sewer connection. Germs killed by chemical. Easily emptied as the ash pit of a stove.

### Agents Wanted

We want one live carpenter contractor in each town to act as our agent. Good profits for little work. **We help you sell them. Write today for complete details.**

**Rowe Sanitary Mfg. Co.**  
202-A 6th St., Detroit, Mich.

Ask about the Ro-San Washstand. Hot and cold running water without plumbing.



## The Tried Tool

Use alone is the mechanic's test of a tool. Every year of the thirty-odd years that the Irwin Bit has been in use has been a year of test. That is the foundation of the user's faith in Irwin Bits.

## THE IRWIN BIT

isn't a bit of a certain pattern—although it is the original solid center bit. It is the bit of a standard of quality—quality in material and quality in workmanship. The Irwin twist is not difficult of imitation. But the Irwin heads have baffled reproduction and the Irwin special crucible steel has defied simulation, through all the years that the Irwin Bit has held its place as standard.

Look for the name Irwin on the shank of the bit when you buy. That's the only way to be sure it's an Irwin through and through. The Irwin price gives you the best. To pay more, or less, is extravagance.

**The Irwin Auger Bit Co.**  
Wilmington, Ohio

**The IRWIN Bit**  
Reg. U.S. Pat. Office

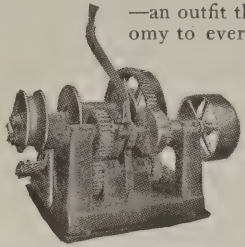
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## The "Bull-Dog" Hoist Is a Builders' Hoist



—an outfit that assures a direct economy to every user. Hundreds have said so. Extraordinarily durable and adaptable to many kinds of service.

The No. 2 illustrated, is arranged for belt drive. Details on hoists directly connected to engine, are given in catalog No. 21.

**Bates & Edmonds Motor Co.**  
Lansing - - Michigan

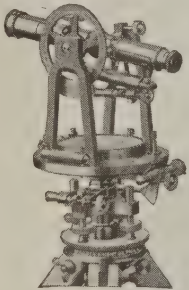
## Estimator's Price Book

World's best book on estimating. 217 pages; cloth bound; price \$1.25.

**Hicks' Estimating Data Blank.** Insures accuracy and easy estimating. Sample book, six blanks, 10 cents.

**I. P. Hicks, D1 Ames Station, Omaha, Nebraska**

## You Can't Afford to Buy a Transit Every Day!



When you **do** buy, select the instrument with Accuracy, Rigidity and Service built right into it!

Up-to-date construction means less weight, greater strength, easier to operate, longer service, minimum up-keep cost.

Write **today** for Vest Pocket Manual, No. 30 Circular and Special Offer for this month.

**WARREN - KNIGHT CO.**  
Makers of "Sterling" Transits  
and Levels

136 No. 12th St., Philadelphia

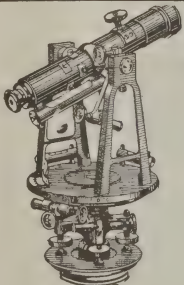


## WHITE'S IMPROVED LEVEL

This is an accurate and inexpensive instrument, especially designed for work where a general-purpose level is required. **Telescope is 12' long, with magnifying power 25 diameters and will detect an error of 1-16 inch**

in 300 feet. Ask for catalogue and special discounts. Ask today!

**David White Co., Inc., 420 E. Water St., Milwaukee, Wis.**



## Builder's Transit

For the builder or architect who wants to raise the standard of his work—who takes conspicuous pride in the accuracy of his efforts, this transit is especially designed. It is but one of the complete line of Beckmann quality instruments. Send for our complete free catalog.

**The L. Beckmann Co.**  
101 Adams St., Toledo, O.



search should give much-needed information on this important subject.

Another thing which has been a source of annoyance to architects is a designation for metal lath that will be comprehensive and free from misconstruction. In the development of metal lath, whether of a form expanded from sheets or woven from wire, it has naturally been the practice to designate the material by the gauge of the metal.

The best building practice demanded the heaviest material—24 gauge in expanded metal and 18 gauge in wire—but with the development of new forms of metal lath it was found possible in some forms to still keep within the letter of the specifications, but furnish less material, in other words, the tendency was to supply an increasingly larger area of holes surrounded by strands of metal that were of the full gauge, and the weight per square yard would be correspondingly reduced. This problem was approached by the Metal Lath Association in the same fair-minded way that has characterized all of the co-operative work carried on by that industry with the result that at a recent meeting of the Association, a resolution was passed to the effect that all metal lath in the future would be designated alone by weight, and in a metal lath hand book now on the press, the recommendation made by the Association is that in all specifications metal lath be required to be painted if not galvanized and to weigh not less than 3 $\frac{3}{8}$  lbs. per square yard.

It is quite unusual that the constituents of an industry can so far waive individual advantages and forget their differences as to unite on an elementary action of this sort.

## Domestic Comfort.

While some manufacturers have specialized in making the front of the house most attractive and the living room perfect in their appointments, the Faultless Iron Co., St. Charles, Ill., have paid more attention to the kitchen, pantry and bathroom. Their White House line of kitchen cabinets, tables, trays, medicine cabinets, etc., are designed to give the greatest comfort to the housewife and to present the finest appearance.

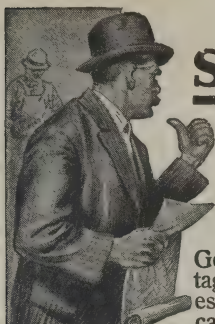
All of the above mentioned furniture is all metal finished with white enamel, thus providing the very finest surface from a

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is all you want. Just a chance to show what stuff you are made of. But, remember, there's one thing that counts, **TRAINING.**

Get the RIGHT training right. If you've never had the advantage of a first-class knowledge of building, plans, specifications, estimating, contracting, etc., then here's your chance. Our "Chicago Tech." Day and Evening Schools have hundreds of carpenters, builders and men of the building trades who are studying under the expert teaching of Chicago's leading architects, estimators and contractors. If you cannot attend these Day and Evening Classes, you can study the same work at home by the "Chicago Tech." method. Our new, quick, easy plan to qualify you in a short time by home study.

**Better things are in sight.**

**Mark and Mail this Coupon NOW!**

WE FURNISH  
**Free**  
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\$15.00  
DRAWING  
OUTFIT

Mark "X" opposite work in which you are interested. Without obligation on you we will send full information free.

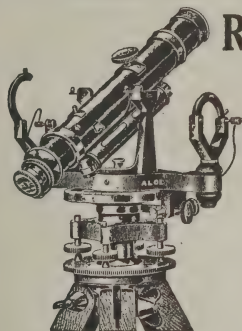
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| <input type="checkbox"/> Builders' Course       | <input type="checkbox"/> Structural Steel Drafting |
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| <input type="checkbox"/> Plan Reading           | <input type="checkbox"/> Reinforced Concrete       |
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## Rent This Level 10 Months, Then It's Yours

**Builders — Contractors** — This is not the old style Architect's Level. It is the newest 1915 model **convertible** level. There is not a single Builder or Contractor who has not almost daily need for this instrument. For laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning shafting, walls, piers, etc., for getting angles, locating levels anywhere, ditching, laying streets and walks, running straight lines, and a hundred other uses.

### Instruction Book Free

Complete illustrated booklet telling how a builder or contractor can use the convertible level sent free on request.

### Send Coupon—No Obligation

Send the attached coupon today and we'll send illustrated booklet and complete details of how you can own the Aloe Convertible Level for 10 months' rent.

**A. S. Aloe Co., 613 Olive St., St. Louis, Mo.**

### Warning

The Level we offer is the Aloe Convertible Level. Don't confuse the Convertible Level with the ordinary old style Architect's Level. The only work that can be satisfactorily done with the ordinary Architect's Level is the determining of elevations. But the Convertible Level, besides its use as a level, is a modified "Transit" and broadens the use of the level 100 per cent. You can't afford to buy any but the Aloe Convertible Level.

### Half Century Reputation

We have been manufacturers of transits and levels since 1863 and our instruments are the standard of the world.

### Free Trial

We allow you to convince yourself by a trial of the instrument before you obligate yourself.

### The Rent Buys It

No large cash outlay needed. Just pay the monthly rent for a few months and the instrument automatically becomes your property.

### COUPON

A. S. Aloe Co.  
613 Olive St., St. Louis, Mo.

Please send free instruction book on the use of the Convertible Level and complete details of your rental plan. This request in no way obligates me.

Name .....

Occupation .....

Street .....

City ..... State .....

National Builder, Feb., 1915

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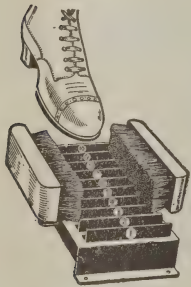
sanitary standpoint. Much of their equipment is designed on the unit plan, so arranged that the various sections fit into and against each other and so built up as to provide any required accommodation. This furniture has found especial favor in many of the high grade apartment houses where both owner and tenant appreciate their neatness and convenience.

A catalog which the Faultless Iron Company have issued shows their complete line in detail, giving sizes of the various parts and units, and is so arranged that the architect or contractor can select the units necessary to build up any desired arrangement. This catalog will be of interest therefore, to those who have to do with the planning or building of houses or who wish to fit up the houses in the best manner. White House fixtures in an apartment or house will add greatly to the rental value, and may well be the means of securing a desirable tenant or making a sale of the entire building.

The Faultless Iron Company will be glad to confer with architects or contractors about any of the above mentioned equipment.

### "Wipe Your Feet."

Isn't it exasperating to finish a nice home, wax the oak and maple floors and then have some one come in with muddy feet, track them all up and spoil the appearance of the entire job?



This is what happens time after time and the house is not equipped with a suitable foot scraper. The contractor should see that one is put in for his own protection even if it is not absolutely specified in the contract.

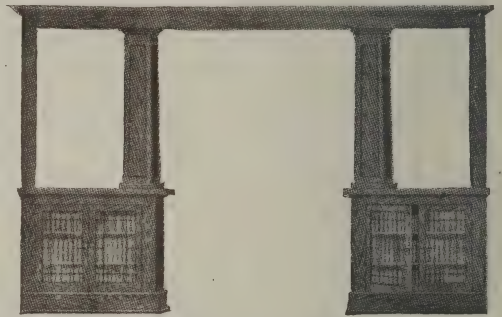
Department 59, of The Security Mfg. Co., Toledo, O., have designed an automatic adjustable foot scraper which can be installed for any building and which will prevent the disagreeable results above mentioned.

The contractor is looked upon as the man to make suggestions to the owner regarding providing details of this character and he should have a circular of the Security Mfg.

Co., which will give him prices, and other information, and also outline the equitable selling and agency plans by which he can install them both in new and old houses. As much of the available territory has already been given to agents, our readers are urged to make an early application for their territory.

### The Red Fawn Bookcase Colonnade.

The contractor today must build in more or less furniture and one of the features of this kind is a combination colonnade and bookcase such as is shown on this page. This



particular kind is made by the Barrows and Donnellan Co., 8745 Baltimore Ave., Chicago, Ill., who have an exceptionally complete circular of millwork, lumber, built in furniture, such as side-boards, consols, colonnades, bookcases, etc.

The contractor who has a list of material on which he wishes a figure would do well to send it to the Barrows & Donnellan Co., and get a dependable price on up-to-date material. The circular mentioned as well as the complete estimates will enable the contractor to not only show his clients exactly what he proposes to furnish but will also show him how he can save money at the same time. The Red Fawn folder is of course free to our readers whether they send in a bill of material for estimate or not.

### The Convention of the American Concrete Institute.

The eleventh annual convention of the American Concrete Institute will be held at the Auditorium Hotel, Feb. 9th to 12th. The convention will mark the completion of the tenth year of the Institute and an especially interesting and profitable program is being arranged. The various papers and



# From Dinner Pail to Drafting Table

One year ago a young man in an Iowa town was working as a machinist's helper at \$1.75 a day. Now he is a Draftsman in the offices of a large manufacturing concern at a salary of \$1200.00 a year. The American School of Correspondence trained him for this position.



Here is your opportunity to get the training you need to hold down a similar job and earn big money—\$100.00 to \$250.00 per month paid to expert draftsmen. Our easy, practical method will teach you **ARCHITECTURAL DRAFTING, STRUCTURAL DRAFTING or MECHANICAL DRAFTING** in a few months. You will receive **expert individual instruction** in the course you select. All drafting instruments and materials supplied absolutely at cost. Also big four volume Cyclopaedia of Drawing sent free if you enroll now. Drafting is the foundation of all engineering professions. Prepare yourself for a real man's work. This special offer is made by the greatest non-resident educational institution in the world—a school whose guarantee is backed by seventeen years of successful teaching by correspondence. Just sign and mail the coupon.

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Gentlemen:—Please send me full information about the course checked below, also further particulars regarding the drafting outfit furnished at cost and the library included FREE with this course.

....Mechanical Drafting  
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....Architectural Drafting

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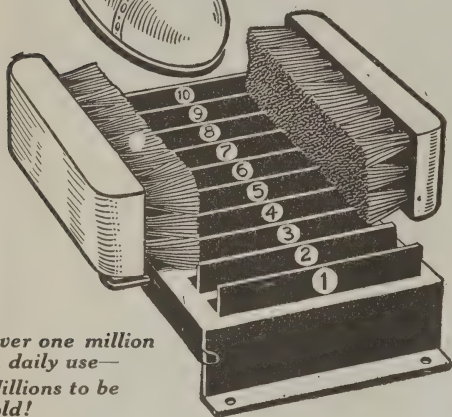
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## \$25.00 Paid For One Day's Work

*New—Mighty  
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*Over one million  
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Millions to be  
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## The Million Dollar Hit!

New, wonderful home invention, just introduced, yet **million sales already recorded**. Tremendous, rapid sale staggers country. Agents happy—banking enormous profits daily. Mighty opportunity for you to get the mighty dollar. Failure impossible. **Experience unnecessary**. Money rolls in first hour—\$10.00 to \$30.00 daily. Amazing cash records made. Walters made \$25.00 first day; never sold goods before. Arnold N. D. Carpenter, orders one, then 2 gross; sold 160 in 2 days.

## Cleared \$80.00 in 2 Days

Hagen, Texas, sold 100 in two days. Webb, Pennsylvania Contractor, averaged 10 sales per hour. O'Connell, Montana, 25 first day. Mike Bock, Minn., writes: "They are fine sellers; worked one day and sold 30 (profit \$15.00). Harry Gassmann, Illinois: "Can sell scrapers as fast as I can get them. Overwhelmed with orders. Everybody wants scrapers; 100 already sold." Roy Burningham, Mass.: "Send 10 dozen. One week's work." Hundreds like these. You, too, can have money in abundance.

## Grab's Scientific Shoe Cleaner

sells itself—you take orders—that's all. Every family wants one on their doorstep. Replaces unsightly, unsanitary, crude door mat. **Automatically removes mud, dirt, snow from shoe in one operation**. Cleans sole, sides, heel. Works like magic—sells like "sixty." Saves drudgery, time, money, shoes—saves carpets, floors. Mechanical wonder. **Has 7 new patented features not found in any other scraper—10 steel blades—10 dirt outlets—twin adjustable and removable brushes—compound springs. Rotates for sweeping. Can't clog—practically self-cleaning. Handsomely enameled. Nothing else like it. Nothing so popular—so easy to sell. Selling price only \$1.00. You make half—100%. Satisfaction guaranteed. Write quick for free catalogue—exclusive agency. Better still, send order, naming territory. Investigate anyhow.**

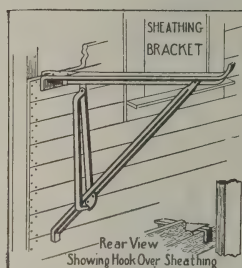
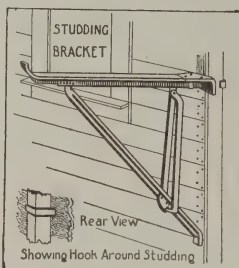
**Security Manufacturing Company**  
Department 59 - Toledo, Ohio



## Hudson Asphalt Shingles Red or Green

—make durable, attractive and economical roofs for all kinds of buildings where shingles can be used. Positively will not crack or break, resist fire, require no painting. Colors are non-fading. Write today for samples and literature.

**Asphalt Ready Roofing Company**  
9 Church Street - New York, N. Y.



## Save \$50

It is an actual fact that one dozen of the Detroit Brackets will save you from \$30.00 to \$50.00 on every house you build, in labor, time, and lumber. You can put up your scaffolding in an hour's time where it would ordinarily take you very nearly a day.

Up-to-date contractors see the advantages of Scaffold Brackets and are reaping the benefit at the expense of the less enterprising.

A trial will convince you and we would be pleased to make you the following special trial prices:

No. 1—3 ft. Sheathing Bracket.....	\$15.00 per doz.
No. 2—4 ft. Sheathing Bracket.....	18.00 per doz.
No. 3—4 ft. Studding Bracket.....	20.00 per doz.

Cash to accompany order.

If these brackets are not entirely satisfactory in every way we will refund your money as cheerfully as we have received it.

Remember you will have safer and far more reliable scaffolding and can use the brackets for years to come.

**FOLDING SCAFFOLD BRACKET CO.**  
60 Lafayette Ave. Detroit, Michigan

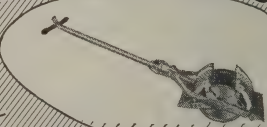
## The WEBER DOUBLE ACTING Floor Scraper

# CONVINCES ANY JUDGE OR JURY ON EARTH THAT THE WEBER

IS THE BEST  
ON THE MARKET

5 Days Free Trial  
Will Prove It

**WEBER MFG. CO.**  
661 7TH AVE, WEST ALLIS, WIS.



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expressions which will be taken up will no doubt prove of great value to those who can attend.

It will be noted that the convention is held at practically the same time as the big annual cement show which will be held in the Coliseum Feb. 10th to 17th. Those who are planning to attend either of these affairs will no doubt be interested in some of the leading features of each.

### A Chance for Agents

The W. A. Anderson Tool & Supply Co., 14-16 Macomb St., Detroit, Mich., advise us that they wish to appoint several agents for their concrete mixer, as well as their other tools and appliances for contractors' use. They have a most attractive proposition not only to those who wish to take the agency for their equipment, but also to contractors and builders purchasing such equipment as they need.

### Helping the Contractor

One of our subscribers accepted the offer of the Southern Cypress Manufacturers' Association, 1212 Hibernia Bank Bldg., New Orleans, La., and obtained a fine pocket library. He tells what good use he made of it.

Southern Cypress Mfg. Ass'n,  
New Orleans, La.

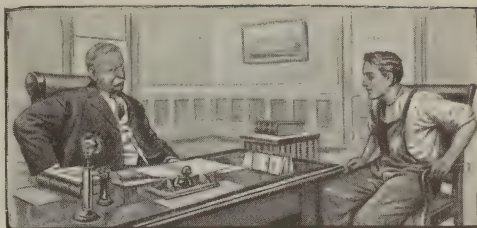
Gentlemen: I wish to thank you for sending me the five volumes of the Cypress Pocket Library. They certainly are very instructive and helpful in my business. I am building already one of No. 6 sun parlors and have also five orders for sleeping porches. I use only Cypress lumber for them, which I buy here from the Dimock-Gould Lumber Company. I have always calls for porch work, boats, arbors and pergolas, etc., and would appreciate it and thank you very much if you would be kind enough to send me the following numbers of the Cypress Library:

Nos. 8, 16, 19, 28, 32, 33, 34, 36, and 37.

Very respectfully yours,

J. E. HELMRATH.

If Mr. Helmrath took Volume 35 of the Cypress Pocket Library and, by using it, solicited business to the tune of one sun parlor and five sleeping porches, he certainly was taking advantage of an oppor-



## "I'll tell you what's holding you down"

"It's on headwork that you are short, Jim. You've never learned to do anything better than the other men in the gang. That's what's keeping you down.

"Why don't you learn to figure contracts, lay out work, draw plans, and handle jobs? We *never* have enough *trained* men. I've got openings now for two first-class foremen and a competent draftsman."

Probably you, too, are ambitious to make more money—or you want to get into business for yourself as a builder. And you *can* do it—it's only a question of getting the necessary training.

You won't have to leave your home or give up your job to get this training. The International Correspondence Schools will teach you by mail right in your *own home* after working hours. They have trained thousands of men for good jobs as contractors, foremen, draftsmen and architects—they can do the same for YOU.

Find out how the I.C.S. can train you for a better job. **Just Mark and Mail the Attached Coupon—NOW.**

### International Correspondence Schools Box 1332-M, SCRANTON, PA.

Please explain, without obligation on my part, how I can qualify for the position before which I mark X.

Architecture  
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Building Foreman  
Structural Engineer  
Structural Draftsman  
Concrete Construction  
Law for Contractors  
Estimating Clerk  
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Electric Lighting  
Plumbing & Steam Fitting  
Heating and Ventilation

Plumbing Inspector  
Mechanical Engineer  
Patternmaking  
Civil Engineer  
Surveying and Mapping  
Commercial Illustrating  
Mining Engineer  
Gas Engineer  
Automobile Running  
Bookkeeper  
Stenographer  
Civil Service Exams.  
Advertising Man

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St. and No. \_\_\_\_\_

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Present Occupation \_\_\_\_\_

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**Carpenters and Contractors Can  
Make 75% Profit Selling Removable**

## Steel Clothes Posts

Owners like them better than wooden posts. No holes to dig—sockets separate and easily driven into the ground.

Write for Folder N and agency proposition. You will find Removable Posts easy to sell, taking little time, giving good profits.

**MILWAUKEE STEEL POST CO.**  
500 Iron Bldg., Milwaukee, Wis.

## BUILD YOUR OWN GRANDFATHER'S CLOCK

*With Our Help*

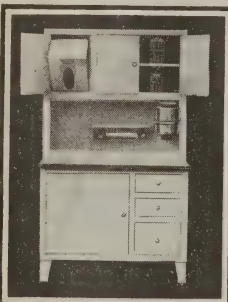
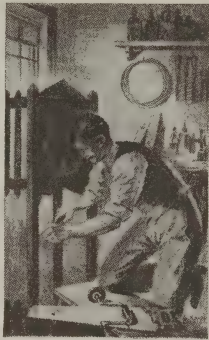
We furnish blue prints, finishing material and instructions. Buy the works, dial, weights and pendulum from us at surprisingly low prices.

You make a fine profit building artistic clocks for your friends.

Complete works, \$5.00. Others with chimes at all prices.

Ask for attractive free offer.

**CLOCK COMPANY**  
1657 Ruffner St., Philadelphia, Pa.



## White House All Steel Kitchen Cabinet No. 1

**Price \$46.00**

Floorspace 24x39 inches.  
Height 68 inches. Special  
introductory price.

Write for catalog showing  
many styles and  
sizes.

**The Faultless Iron Co. : : St. Charles, Illinois**

## MAXWELL'S Window Shades

- ☐ Always give satisfaction.
- ☐ Stock shades of every description.
- ☐ Special sized shades made to order.

**S. A. Maxwell & Co.**

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Kansas City

tunity given him by the Southern Cypress Manufacturers' Ass'n to keep himself busy for several months. Furthermore, he grabbed just the right idea in that the man who desires a sleeping porch does not have to wait until he builds a new house, but can add it to his present house. Too many carpenters and contractors neglect the man who has already built and are merely looking for the man who intends building. To our mind a much better business can be done with the man who has already built than with the other, for, in the first place, there are several times as many, and, in the second place, competition is not so keen for the business. We believe almost any carpenter in the country, with proper ability to talk, can take Volume 35, make a house-to-house visitation through his town, and book a large number of orders. He can talk Mr. Man into it, even if Mr. Man had never before thought of such a thing.

## Pergola Album.

The Hartmann-Sanders Co., 2155-87 Elston Ave., Chicago, issue a fine Pergola Album. This Pergola Album—"T28"—illustrates pergolas, garages, lattice fences, veranda treatments and garden accessories. It will be sent to those wanting it for ten cents in stamps.

## The Art Student.

Pride in one's work is always increased when there is a tangible and lasting result. The frame of a building does not call for as fine work and does not give the mechanic as much reason for pride in his work as does the laying of a fine hard wood floor or the hanging of a door. Seeing the finished results is of value and interest.

The artist deals primarily with finished results. His drawings and paintings are articles of real interest. The more capable he is the more pride he can take in his work, for it will be more lasting.

The School of Applied Arts, Dept. N. B., Battle Creek, Mich., have causes of instruction by which the student, whether he be apprentice, mechanic or contractor, can become proficient in preparing plans, perspectives, or other forms of finished drawings. Their free prospectus gives a large amount of information on their methods, courses, etc.

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## Banner Building Year Predicted

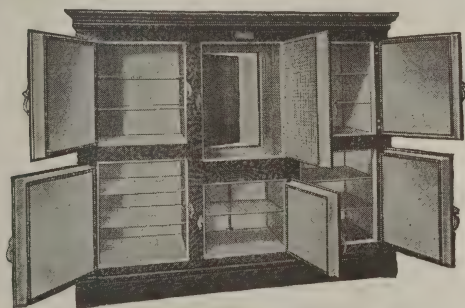
That is the opinion of authorities on building. All the more reason, Mr. Contractor, while winter lingers, for you to give your men thirty days' solid work putting in Maple, Beech and Birch Floors.

Get the jump on spring job work. Start NOW by making contracts for hardwood floors. Laying them is inside work and may be done any time.

You will interest every customer to whom you talk Maple, Beech and Birch Floors. Your first appeal may not bring the order. There may be a desire to "talk it over," BUT, you will have placed yourself before your customers in the right way and if the time is not ripe to put in Maple, Beech or Birch Floors your call may result in orders for other work and the hardwood floor will come later.

"Your Flooring Problem Solved" will interest every one of your customers. We shall be glad to send you a supply to "go around." How Many Can You Use?

**Maple Flooring Manufacturers' Ass'n**  
Stock Exchange Building, Chicago, Illinois



A GOOD REFRIGERATOR must have real inside value to secure satisfactory results.

Real value means—perfect insulation of all walls, close fitting doors—positive circulation of pure air—inner walls that can be kept clean and sanitary.

You can always feel safe in buying for your own home and in specifying, recommending and installing the Herrick for homes, hotels, stores, clubs, cafes, etc., you are building.

We want to send you free plans and specifications for outside icing, they are inserted in back of new Catalog No. 23 N which is free on request.

Herrick Refrigerator Co., Waterloo, Iowa



# Herrick



## Specify a McCray

Then you will go a long way toward solving the "service end" of the new home. You will delight your clients with the convenience of arrangement and the satisfaction of giving them the very newest and best in scientific refrigeration. For the most elaborate mansion or modest of cottages there is a

## McCray Refrigerator

either in stock sizes or built-to-order, that can be made a part of the house and arranged for outside icing. The outside door for icing keeps the iceman and his muddy feet away from the kitchen. In cold weather no ice is needed.

The opal glass or porcelain linings are sanitary and easy to clean. All the foods are kept fresh and cool and free from spoiling. All the odors and impurities are carried away through the water sealed drain pipe.

McCray Refrigerators are used wherever perfect refrigeration is demanded.

### Plan Service Free

We maintain a complete draughting department and employ practical draughtsmen, thoroughly trained in the principles of scientific refrigeration. These men are at your service free. Send us your floor plan and we will send you refrigerator suggestions.

### Get These Catalogs for Your Files

No. 92—Regular Sizes	No. 69—For Grocers.
for Residences.	No. 50—For Hotels,
No. AH—Built-to-Order	Clubs, Institutions.
for Residences.	No. 61—For Meat
No. 73—For Florists.	Markets.

## McCray Refrigerator Co.

748 Lake Street, Kendallville, Ind.

New York, McCray Bldg.,  
7-9 W. 30th St.

Chicago,  
1000 S. Michigan Ave.

For branch salesrooms in other cities,  
see your local telephone directory

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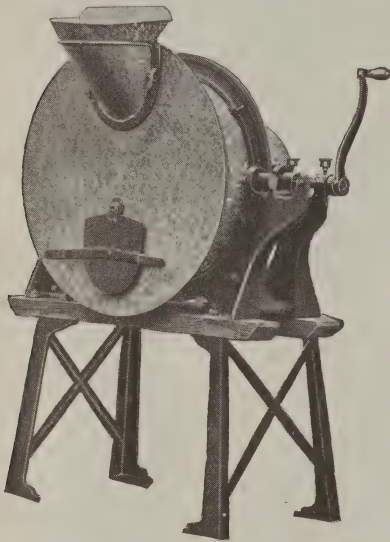
### A Hand Power Concrete Mixer

Satisfactory concrete can only be obtained by thorough mixing, and the contractor who fails to mix by machine loses in several ways. First, the concrete is not so well mixed and so not as strong as when properly mixed. Second, it requires more cement to give a required strength. Third, it requires more time, adding to the cost as well as hindering the progress of the work.

So a mixer being essential, it only remains to make the selection. The contractor having a number of jobs on which only a relatively small amount of concrete is needed at one time is, of course, unable to move a heavy power mixer all over town every day or two. Shovel mixing is too ex-

contractor may actually use the outfit on practical work before accepting it.

We are not prepared to say how long this offer will be open to our readers, so it would seem to be well to investigate the



Giesler Mixer Ready for Charging.

pensive and unsatisfactory, especially when there is a mixer designed especially for this class of work.

The Geisler Mixer, made by the Galland-Henning Mfg. Co., 1102 Railway Exchange Building, Milwaukee, Wis., has a capacity of two cubic feet of concrete, about 350 pounds to the batch. The cement, sand and aggregate may be mixed dry or may be put in the drum separately, a few turns thoroughly mixes them, and the drum is quickly emptied into wheelbarrows or buckets.

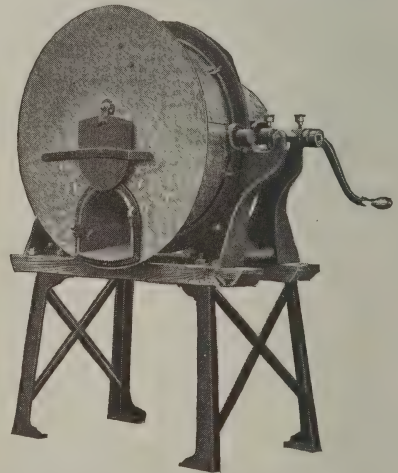
The Galland-Henning Mfg. Co. has a catalog which gives full details of the construction of this mixer as well as describes the riskless trial offer under which the



Giesler Mixer Ready for Operation.

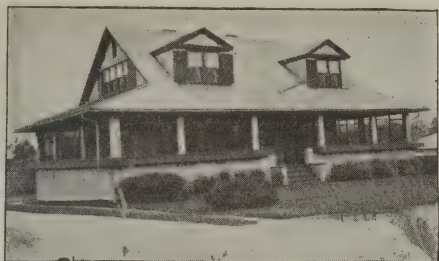
offer at once, read the catalog and try the mixer.

The contractor with a mixing outfit has a peculiar advantage. He can use it in his own work, making money on his own jobs.



Giesler Mixer Ready for Discharging.

He can take many subcontracts in which concrete is used. He may rent the machine to other contractors, making a good profit and paying for the machine as well.



## EVERYTHING IN WOODWORK in any kind of wood CYPRESS A SPECIALTY

Logged by us on the Florida Gulf Coast (where the best Cypress grows;) well seasoned in its native climate, which is absolutely necessary to insure proper curing; nicely worked in our big up-to-date plant at Neponset, Boston.

From stump to consumer means only one profit for you to pay.

We solicit inquiries on car lots to anywhere or any size lots from Eastern builders.

Our interesting booklet No. 25, "Cypress and Its Uses," sent free on request.

**The A. T. STEARNS LUMBER CO.**  
25 Taylor St., Neponset, Boston, Mass.  
Lumber, Gutters, Mouldings, Casework, Etc.



## Right Buying Will Increase Your Profits

Start the New Year right by  
lowering your buying cost

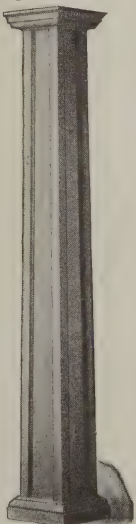
Lowering your cost means raising your profits; and you *can* do it. We do nothing but sell *good* building material to building owners and contractors at *factory prices*. Our plan enables you to get the *highest quality* goods for far below the usual cost of inferior products. This is possible because we are National

### Headquarters for Millwork, Mantels,

Fireplaces, Doors, Windows, Ready Roofing, Flooring, Mouldings, Columns, Porch and Stair Newels, Grilles, Colonnades—everything, in fact, used in building construction.

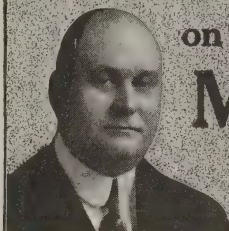
That "Huberizing means Economizing" is proven by our two big catalogs—one on millwork, the other on mantels. These explain how we can sell so cheap and make immediate shipments. Write for them.

**The Huber Builders Material Co.**  
39-43 Vine St., Cincinnati, Ohio



# Save 50%

on Your Building  
**Material  
Bill!**



**L**ET me send you our Building Material Catalog showing 8000 price bargains on building material and also our Plan Book showing views and floor plans of 50 modern Houses and Bungalows. They will prove you can build, remodel or repair for much less than you expected. We ship everything everywhere in the way of high grade lumber, flooring, roofing, doors, windows, storm sash, mouldings, porch work, screens, hotbeds, building hardware, paints, wallboard, plumbing, heating and water supply outfits, cement machinery and interior woodwork. *All at Wholesale Prices Direct to You.* Quality, safe delivery and satisfaction absolutely guaranteed. Both Books Are Free.



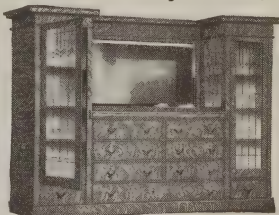
Material Complete  
for Houses from  
**\$398.00 up**

**CHICAGO MILLWORK SUPPLY CO.**  
"AMERICA'S GREATEST SASH AND DOOR HOUSE."  
W. H. Manning Pres.

### BUFFETS

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and up  
Built-in Cases  
for every  
purpose are  
shown in our  
free catalog



Our Big Free  
CATALOG  
shows our full  
line of  
Colonnades  
and Grilles

This Bookcase  
COLONNADE  
complete as  
shown  
8 ft. x 8 ft. Yellow  
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Oak, Birch or  
Cypress  
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model or repair un-  
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Supply Company  
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Chicago, Ill.

Please send me your two  
free books.

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## Draw Perspectives —and Earn More Money

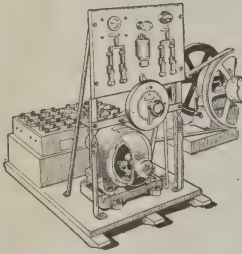


Building contractors able to make their own perspectives can increase their profits by effecting a valuable saving in time and money. We teach it *thoroughly*.

As a *business*, this work offers excellent opportunities—men earn big salaries. More offers of positions than graduates to fill them. Write for free prospectus.

**School of Applied Art**  
Dept. N. B. Battle Creek, Mich.

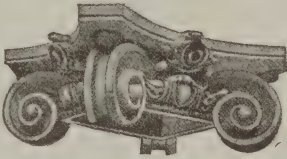
## Electric Light For Farms and Suburban Homes



"Isolated" plants furnish the safest, cleanest and most efficient and economical lighting system ever offered. Plants comprise dynamo, switchboard, gas or oil engine, batteries, belt, Mazda lamps, etc. No big investment required. A profitable business for building contractors who recommend and install our plants. Write for literature and prices.

**Isolated Electric Plant Co.**  
66½ W. 106th St. New York

Standard and  
Special Designs in  
Interior and Ex-  
terior Ornaments  
In Plaster, Cement  
and Composition



Send us your blue prints for fine residence, theater and other public building work. Beautiful designs; best workmanship. Unusually low prices.

**Architectural Supply Co.**

Harry A. Lang, Prop.

420 High Street Fort Wayne, Indiana

## Are You Going to Build?



Send 25c in silver (and 10c postage) for our big \$1 book of plans. "LOW COST MODERN HOMES," with houses from \$1,000 to \$3,000. "PALATIAL MODERN HOMES" from \$3,000 to \$10,000, price 25c and 12c postage. "COTTAGES AND BUNGALOWS" from \$300 to \$9,000, price 25c and 5c postage.

**J. H. DAVERMAN & SON, Architects**

1342 Murray Building

GRAND RAPIDS, MICH.

## A Real Cypress Plant.

Lovers of handsome finish among our readers would be interested to visit the mills of the A. T. Stearns Lumber Company, 25 Taylor St., Neponset, Boston. This firm introduced Cypress into the Eastern section of the country a good many years ago and are specialists in it. The founder of the firm, Mr. A. T. Stearns, learned that there was a certain section of the country where the best Cypress grows just the same as Michigan produces the best pine. This soft, beautiful grained Cypress comes from the Florida Gulf Coast and there Mr. Stearns located his mills and bought up timber land.

Cypress is a wood which has been much abused by being put on the market improperly cured but this firm takes great care in its preparation, seasoning in the South for some time, where the atmospheric conditions allow it to dry slowly, so that it dries into a soft workable condition instead of being brought to the Northern climate immediately after cutting, which causes it to harden and split.

They carry a very heavy stock in the South, drying, and also carry a large stock at their mills in Neponset, so that they can make very prompt shipments on large or small lots. As they cut their own stock as long as the log permits, they are headquarters for architects and builders who desire something extra good for pergola work, long beams, boat stock, etc., as well as inside and outside finish material. They usually ship carload lots direct from the South; small lots to Eastern builders from their mills at Neponset.

They have a very interesting booklet, No. 25, on Cypress Lumber and Its Uses, which is free for the asking. They also have special catalogs for their mouldings, doors and greenhouse work and if you are interested along any of these lines we are sure they will be glad to send you some of their literature if you will communicate to them your wants.

## Increase in Chicago Building.

The most remarkable feature of the building situation throughout the country in December is the fact that Chicago shows an increase over the corresponding month a year ago, the other large cities showing a loss, and is also one of the 20 out of a total of

Advertisers' Section

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## We Invite Every Carpenter-Contractor

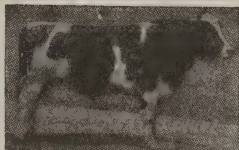
TO SHARE THESE BIG HELPS—

Absolutely RIGHT Grades of Lumber. HIGH CLASS Millwork—none better. HELP of Our 20 years' experience **Wholesaling to Contractors Exclusively.** THESE HELPS have made many Contractors Successful, Prosperous Business Men. On **Equal Goods** our prices are not beaten.

## LUMBER and MILLWORK

For Handsome Homes  
and Bully Barns

We want to figure  
your Lists. LIST  
Lumber and Mill-  
work from Plans and  
mail Lists to us for  
Estimates. Bottom  
market NOW.



**BARROWS &  
DONNELLAN Co.**

8745 Baltimore Ave.

CHICAGO

We are now offering

## ROBERDS IDEAL WALL BOARD

finished in exact reproductions of the quarter-sawed oak, so perfect that even the most skilled observer cannot tell it from the genuine wood.

In this form *Roberds Ideal Wall Board* solves the problem of interior finish, both for side walls and ceilings, giving the most artistic and beautiful results at the minimum cost.

Write today for free samples and prices of the most complete wall board line. Finished in gray, tan, mission oak and quarter-sawed oak.

**THE ROBERDS MFG. CO.**  
104 Railroad St. Marion, Indiana

## We Do Quality Work

And are prepared to do any and all kinds of millwork promptly, in a most satisfactory manner.

Contractors and builders will find it to their interest to get in touch with us when in the market for sash, doors, screens, kitchen cupboards, china closets, and interior finish.

## We Specialize On Door and Window Frames

By reason of having exceptional facilities for turning out work of this character which for quality and workmanship cannot be excelled.

Why not let us figure on your bill of materials? We can add to your prestige as a quality contractor and builder by supplying you with materials that will back up your good reputation.

*Let us get acquainted  
for our mutual benefit*

**S. D. MAYER & CO.**  
318 North B St. Hamilton, Ohio

## This window which is equipped with PULLMAN ALL METAL WEATHER STRIP

is one of several hundred. The man who contracted to install the complete order made a profit of a dollar and a quarter on each window. YOU can get into this profitable business by being our agent.

*We protect you by giving exclusive  
territory*

### *Pullman is the best*

The demand has been created. If you are a live one, sell and install

## PULLMAN STRIP

You buy the strip direct from us at **factory price** and make the **big profits.**

Write today for samples.

**Pullman Metal Weather Strip Co.**  
Agency Dept. York, Penna.

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# Lorenzen

*As Usual* in the New  
**MORRISON**

Chicago's Latest and Greatest Hotel

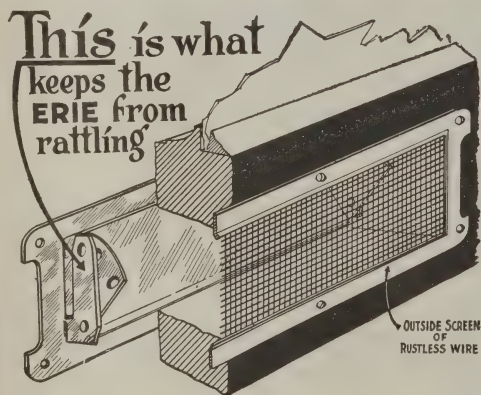
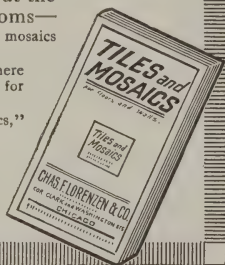
Wherever tile and mosaic work was used in this famous new hostelry, the Lorenzen line was selected.

The walls and floors of the wonderful first floor grill with the attractive blue and white color scheme; throughout the kitchens; in the bathrooms—Lorenzen tiles and ceramic mosaics were used.

This job is only one of many where the Lorenzen line was selected for its distinctiveness and breadth.

Write today for "Tiles and Mosaics," describing our complete line for all sorts of work.

Chas. F. Lorenzen & Co.  
101 N. Clark St., Chicago



## The Erie Sash Ventilator

fits flush to the window sash over a rectangular vent cut thru the rail. It is made of sheet brass, finished to match all conventional hardware, and rustless wire screen.

☐ Simple, noiseless, efficient, economical.

☐ For old or new buildings.

**THE ERIE VENTILATOR & MFG. CO.**  
649 West 12th Street, Erie, Pennsylvania

JOINTS  
CAN'T  
OPEN

## STEEL SEWED TAY-LOCKED COLUMNS



MADE OF WOOD  
SEWED WITH STEEL

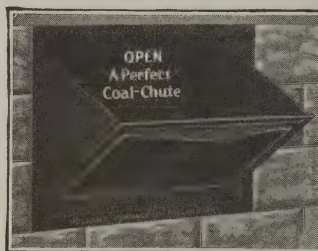
They're different  
Made to last  
Cost no more

Write for Catalog F — A beautiful  
free design book worth owning



**AMERICAN COLUMN COMPANY**  
BATTLE CREEK, MICH.

## The Window Chute



**For  
Your  
Coal  
Bin**

The Window Chute  
is a selling feature  
for Any Residence  
or Building.

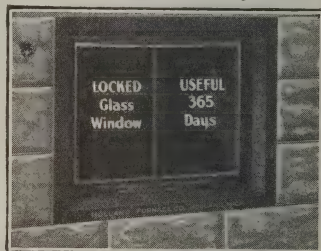
Ready for the Coal Man

**Thousands in Use—The Very Best**

**If You  
Build  
Buy  
Own**

Be Up-To-Date  
and Have the  
World's Best.

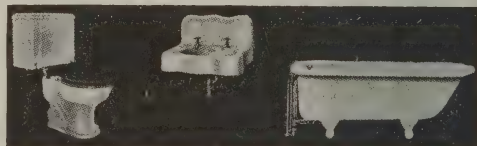
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A Light Basement

**Holland Furnace Co., Holland, Mich.**

World's Largest Direct Installers of Furnaces



**Everything in GUARANTEED PLUMBING  
and HEATING SUPPLIES at WHOLESALE**

Bathroom Outfits, Sinks, Pipe, Fittings, Valves, Faucets, Heating Boilers, Radiators, Water Pressure Systems and Lighting Plants for Country Homes, etc. Our \$200,000.00 plant behind our GUARANTEE. Send for complete Catalog No. 31.

**JOHN HARDIN COMPANY**

30 Years at 45th and Cottage Grove Ave., CHICAGO, ILL.

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67 cities in which there was a gain. In 67 cities permits were taken out in December according to official reports to CONSTRUCTION NEWS for the construction of 7,728 buildings involving \$29,146,805 as against 10,347 buildings costing \$51,520,191 for the same month a year ago, a decrease of 2,619 buildings and \$22,373,386 or 43 per cent. There were increases in twenty cities and decreases in forty seven. The figures in detail are as follows:

Cities.	1914		1913	
	No. of Bldgs.	Estimated Cost.	No. of Bldgs.	Estimated Cost.
Chicago .....	682	\$ 6,214,100	660	\$ 5,934,500
Pittsburgh .....	128	3,473,100	233	917,355
Boston .....	375	3,288,000	426	4,521,000
New York (Boros				
Man. and Bronx)..	493	1,836,816	669	16,473,659
Portland, Ore. ....	259	1,601,355	466	640,565
Detroit .....	360	1,440,530	498	1,904,355
Seattle .....	530	1,298,165	626	549,735
Columbus .....	86	1,005,200	139	432,550
San Francisco .....	473	717,903	409	1,956,339
Los Angeles .....	553	651,639	1,053	2,156,951
Denver .....	130	593,510	72	59,171
Cedar Rapids .....	33	547,650	36	1,057,600
Minneapolis .....	266	521,400	376	1,148,645
St. Paul .....	140	510,640	131	705,184
Milwaukee .....	132	393,410	176	867,468
Rochester .....	166	363,599	196	725,185
Buffalo .....	188	347,000	248	1,284,000
Newark, N. J. ....	126	311,632	468	3,185,828
Oakland, Cal. ....	228	278,891	202	1,099,621
New Orleans .....		274,172		202,133
Baltimore .....	188	243,570	219	419,031
Omaha .....	44	216,475	56	149,475
Richmond, Va. ....	73	212,502	87	170,994
Louisville .....	45	188,330	120	137,820
Worcester .....	69	175,440	96	347,665
San Diego .....	153	173,135	264	403,000
Atlanta .....	154	154,724	224	216,001
Lawrence .....	18	152,100	9	19,150
Syracuse .....	87	145,403	77	193,975
Akron, O. ....	68	143,420	121	304,415
Toledo .....	82	139,945	114	199,320
Scranton, Pa. ....	47	128,406	42	150,988
New Bedford .....	47	86,317	77	277,262
Duluth .....	54	78,975	89	83,855
Birmingham, Ala. ...	251	76,710	395	289,780
Berkeley, Cal. ....	56	73,700	74	233,250
Erie .....	42	73,065	67	119,350
Sioux City .....	27	67,460	39	75,920
Troy, N. Y. ....		61,335		11,464
Des Moines .....	37	48,700	56	114,600
Pasadena, Cal. ....	116	48,648	129	140,166
East St. Louis, Ill. ...	18	45,835	27	27,450
Nashville .....	109	44,290	31	51,578
Tacoma .....	74	43,475	107	114,038
Wilkes-Barre .....	65	43,086	30	53,030
Savannah .....	34	42,945	35	56,175
Portland, Me. ....	17	40,500	31	65,625
Youngstown, O. ....	29	38,450	54	139,820
Kansas City, Kans. ...	21	37,425	40	178,715
Allentown, Pa. ....	21	37,275	15	17,800
Davenport .....	21	36,450	24	57,900
Passaic, N. J. ....	15	36,300	20	26,360
South Bend .....	16	35,980	9	10,250
Lincoln, Neb. ....	8	35,600	28	48,335
Elizabeth, N. J. ....	16	33,518	40	140,816
Springfield, Ill. ....	19	33,375	26	42,680
San Jose, Cal. ....	43	33,203	48	29,655
Altoona, Pa. ....	9	30,079	38	47,528
St. Joseph, Mo. ....	32	24,395	27	21,985
Dayton .....	25	23,005	34	16,030
Charlotte, N. C. ....	7	18,797	20	171,550
Spokane .....	19	18,700	45	63,625
Brockton, Mass. ....	15	14,850	42	107,880
Saginaw .....		12,450		16,200
Hoboken .....	8	10,125	12	83,620
Chattanooga .....	74	9,950	118	48,888
Reading, Pa. ....	7	9,675	7	3,350
Totals .....	7,728	\$29,146,805	10,347	\$51,520,191

Advertisers' Section.



Add renting and selling power to the homes you are building by installing

## Western Electric Inter-phones

A two-station outfit of step-saving intercommunicating telephones—



packed complete with wiring material and illustrated instructions—is easily installed.

Send \$15 by cheque or money order to Dept. 24-BL, and we will send you an outfit by parcel post.

## Western Electric Company

Manufacturers of the 8,000,000 "Bell" Telephones

New York	Atlanta	Chicago	Kansas City	San Francisco
Buffalo	Richmond	Milwaukee	Omaha	Oakland
Philadelphia	Savannah	Indianapolis	Oklahoma City	Los Angeles
Boston	New Orleans	Cleveland	Minneapolis	Seattle
Pittsburgh	Houston	Cincinnati	St. Paul	Portland
St. Louis	Dallas	Denver	Salt Lake City	

EQUIPMENT FOR EVERY ELECTRICAL NEED  
Member Society for Electrical Development. "Do it Electrically"

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The Recessed Steel Medicine Cabinet

## Hess <sup>MEDICINE</sup> ~~SANITARY~~ <sup>CABINET</sup> Locker

### The Only Modern, Sanitary STEEL Medicine Cabinet

or locker finished in snow-white, baked everlasting enamel, inside and out. Beautiful beveled mirror door. Nickel plate brass trimmings. Steel or glass shelves.

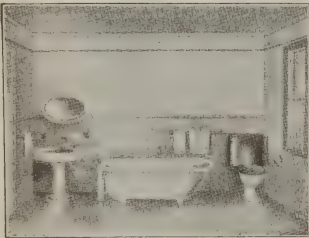
#### Costs Less Than Wood

Never warps, shrinks, nor swells. Dust and vermin proof, easily cleaned.

#### Should Be In Every Bath Room

Four styles—four sizes. To recess in wall or to hang outside. Send for illustrated circular.

**HESS, 907 L. Tacoma Bldg., Chicago**  
Makers of Steel Furnaces. Free Booklet.



## FULL LINE of PLUMBING and HEATING SUPPLIES

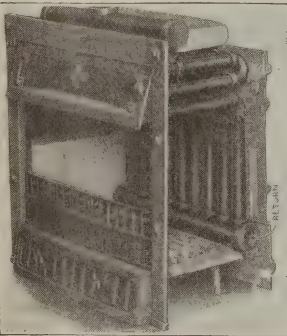
Sold Direct at Wholesale Prices

**20% to 40% Saving**

Complete bathroom outfits, tubs, closets, lavatories, kitchen

sinks, etc. Prompt shipment from a complete stock. The only house selling up-to-date, guaranteed goods at wholesale direct. Write for illustrated catalogue and prices.

**B. Y. Karol, 768-72 West Harrison St., Chicago, Ill.**



## Hot Water Heating Grate from the Fireplace

Cut shows section of our Heating Coil which if placed in any fireplace will heat six times the amount of space without additional cost of fuel and affords the same healthful ventilation. Will suit any fireplace or mantel. Write for descriptive circular.

**Heitland Grate & Mantle Co.**

No. 128 N. Fifth Street  
Quincy - Illinois

## "HOMES OF CHARACTER"

A WONDERFUL BOOK ON HOME BUILDING

containing 128 New House Plans, Illustrations of Interiors and Exteriors and Information on How to Finance, Plan, Build and Equip your new Home.

320 Pages Bound in Cloth. Sent Prepaid for \$1.00. Sample Pages 2c Stamp.

### SPECIAL

Write today for our Special Short Time Plan Offer. Stock Plans at Half Price to Feb. 1, 1915.

**THE JOHN HENRY NEWSON CO.**  
Architects  
1034 Williamson Building  
Cleveland, O.

Of the larger cities Chicago, and Pittsburgh are enjoying the greatest activity, the former showing an increase of 5 per cent in December and the latter of 277 per cent as compared with the same month a year ago. Other cities widely scattered had enormous gains, including Louisville 37 per cent, South Bend 251, Columbus, Ohio, 132, Dayton 43, East St. Louis 67, St. Joseph, Mo., 11, Allentown, Pa., 109, Reading 188, Passaic, N. J., 37, Omaha 45, Denver 903, Portland, Ore., 149, Seattle 136, San Jose 12, New Orleans 36, Richmond, Va., 24, Lawrence, Mass., 172, and Troy, N. Y., 435.

The losses are both numerous and large, affecting a large section of the country, beginning with New York City with 89 per cent, Boston 27, Buffalo 73, Detroit 24, Saginaw 23, St. Paul 28, Minneapolis 54, Duluth 6, Milwaukee 55, Cedar Rapids 48, Des Moines 57, Davenport 37, Kansas City, Kan., 79, Lincoln 26, Springfield, Ill., 22, Rochester 50, Syracuse 25, Worcester 49, New Bedford 69, Brockton 86, Elizabeth 76, Newark, N. J., 90, Hoboken 88, Scranton 15, Wilkes Barre 18, Altoona 37, Akron 53, Youngstown 72, San Francisco 63, Oakland 75, Los Angeles 70, San Diego 57, Berkeley, Cal., 68, Pasadena 65, Spokane 70, Tacoma 61, Baltimore 42, Atlanta 28, Nashville 14, Savannah 23, Charlotte, N. C., 89, Chattanooga 80, Birmingham 73, Portland, Me., 38.

## Exterior Painting.

The exterior of the building depends upon paint, for its final touch of refinement. The home is not finished until the painting is complete. It is very important therefore to the contractor that he be sure to allow the use of only good paint. The poorer qualities may have a good appearance for a time but they are so short lived that the trouble they make for the owner will quicker reflect upon the contractor who allowed their use.

The contractor cannot always tell good paint from poor paint by the appearance, because there are many ways in which adulterations can be imposed upon him unless he is well posted on both the manufacture and composition of high grade paints.

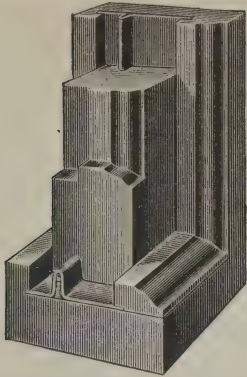
The Carter White Lead Company, 12042 S. Peoria St., Chicago, Ill., are specialists in the manufacture of pure white lead and

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Advertisers' Section



## Get In Business For Yourself

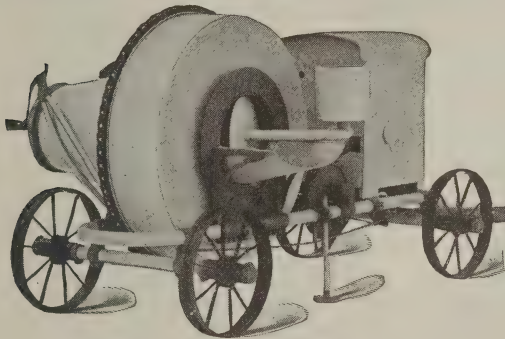
Make big money. Be independent.

### Niagara Metal Weather Strip

(THE WOOD REINFORCED)

¶ Is the easiest sold weather strip on the market—**Because:** It is the strongest and gives greatest protection. ¶ The meeting-rail strips are double nailed. ¶ The spring bronze is extra heavy gauge and straight. ¶ The All Brass Threshold has conquered the door bottom problem. ¶ If you mean business write for prices and literature.

Niagara Metal Weather Strip Co., 737 Main St., Buffalo, New York



Basic Patent on Double Drum. Other Patents Pending.

## Double Drum Batch Mixer

The 42 Centimeter Mixer

The Big Gun Surprise for 1915 in the mixer world. The only correct method of mixing concrete; mixes a batch dry in one drum while another batch is being wet in other drum. Gaining 100% in time and efficiency.

Low feed hopper, 28 inches from ground; light weight.

**Specifications:** Malleable and steel castings; tubular frame and axles. Basic open hearth galvanized iron for drums, shovels, etc.

Our mixer will produce 25% better mix than the old way.

Send for booklet "Why the Double Drum"

Olsen Concrete Machinery Co., Elkhorn, Wisc.

## —gives rafter or stair cuts immediately

This tool does away with all unnecessary figuring. It saves time in framing rafters or making stair cuts. Simpler and quicker to use than the Steel Square. Gives the length, bevel and cuts of all hip, jack, valley and cripple rafters.

## A. B. C. Protractor Square

is not hard to understand and use. You can use it in framing all timbers. Well made, handsome tool you'll be proud to own. Folds up for the tool kit.

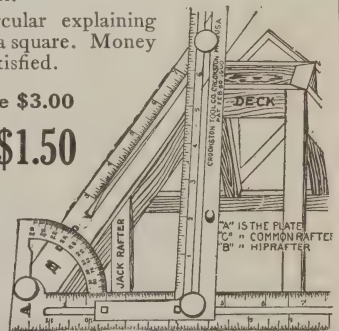
Send for circular explaining uses or order a square. Money back if not satisfied.

Regular Price \$3.00

Special Price for Short Time Only \$1.50

Stamp & Tool Works

La Crosse, Wisconsin



## THE NATIONAL BUILDER,

537 So. Dearborn Street, Chicago, Ill.

I have a friend who I think might become a subscriber to The National Builder. Send him a sample copy and tell him it is sent at my request.

His Name is \_\_\_\_\_

Address \_\_\_\_\_

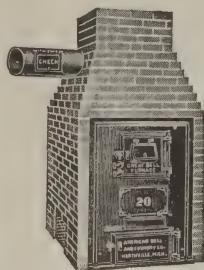
I am \_\_\_\_\_ Address \_\_\_\_\_

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.





# A Hot Air Furnace

you ought to know about. Costs no more than a base burner, heats twice as much on about the same amount of fuel. No pipes, no lost heat. Brick or portable. Write and learn.

American Bell & Foundry Co.  
Northville, Michigan

## \$50 BOVEE ECONOMY FURNACE \$50



At Manufacturer's Prices  
Has a large combustion chamber. Saves one third of the fuel. Has perfect Ventilitating System

The Most Perfect Hot Air Plant Sold

Send pencil sketch of floor plan for our manufacturer's price and illustrated catalog.

Bovee Furnace Works  
60 8th Street Waterloo, Iowa

## The Enterprise Coal and Fuel Shute



The Easiest Installed

Non-Breakable—and Cheapest and Simplest Fuel Shute made. Cheapest because simplest.

Only four pieces—Frame, Spout, Lock and Weight.

Roller bearing hinges; no exposed bolts to tamper with.

Positively no way to open it from the outside. All of cast iron—practically rustless.

Sent to any address on receipt of \$7.50. Write for Builders' and Dealers' Discount

Enterprise Iron Works  
Albert Lea, Minnesota

oil paints. In a recent circular entitled "Pure Paint and How to Know It" they show some of the points to be observed in the selection of paints and give much valuable information, not only for the experienced painter, but for the contractor. We understand that our readers can obtain this booklet as well as much other valuable information from the Carter White Lead Company on request.

### Birch Interiors.

Dependable information on interior finish is contained in a book on Birch Interiors which the Northern Hemlock & Hardwood Mfg. Association, Dept. D., Wausau, Wis., will send to our readers on request. The book contains many beautiful photographs of both interiors and exteriors of modern buildings where birch was used, and will be of immense value to the architect and to the contractor in deciding on the materials which he will use in his buildings. A number of excellent floor plans are given of houses where birch was used together with suggested designs for birch trim, mouldings, casings, etc., showing both the section and the finished surface.

### Special Clamping Bench and Laying Out Table.

Contractors who operate even fair sized shops can use this new clamping bench and laying out table in making screens, storm sash, doors, etc., to advantage. It is built entirely of metal, amply braced and trussed. By its use the hard task of laying out the difficult sizes of frames, etc., is entirely done away with as the various sizes are

Advertisers' Section.

# WHEN YOU MOVE

your paper will **not** follow you unless you notify this office, as magazines are not forwarded from one place to another. When you move, therefore, send this coupon, giving both your old and new address.

The National Builder, 537 So. Dearborn Street, Chicago, Ill.

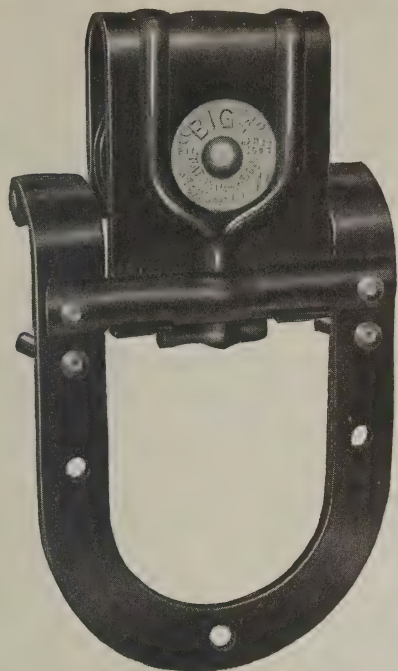
I have moved and wish my address changed as follows:

Name \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_  
Old Address: City \_\_\_\_\_ State \_\_\_\_\_

PASTE THIS DOME  
WRITE TO ADVER-



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## IMPROVED BIG 4 HANGER

Already the leader of Barn Door Hangers, we have still further improved this one by corrugating the steel hood, by giving it a couple of stiffening crimps.

Big 4 Hangers are made entirely of heavy steel, yet are built along the most simple lines, combining durability and strength with our popular *non-cuss* features, stay on, swing out, no stick, no bind, no rust, no cuss—which we always build in. It is also a combined *flexible* and *rigid* hanger. Try it on some of your spring building jobs. It's an investment, not an expense.

Ask for booklet, "Sliding Barn Door Equipment," and send dealer's name.

**National Mfg. Co., Sterling, Ill.**

## Straight Talks on Durametal Weatherstrips

You contractors, carpenters and building owners—why not buy weatherstrips direct from the manufacturer and do your own installing?

By our unique plan we have cut out the usual big selling expenses, which enable you to buy direct from us, make a profit on the strip and good money on the installation, besides.

Durametal Weatherstrips have been successfully sold for over 10 years and have stood every possible test. Their durability and simplicity makes them superior to all others.

Made of best heavy zinc, and fully guaranteed. Write for samples and prices now, before you turn another page. There's money in this for YOU.

*A few agencies open to responsible  
live local contractors and  
carpenters*

*Durametal Weatherstrip Co.*

14 East Austin Ave., CHICAGO, ILL.

## Hess Steel Furnaces



are sold to **contractors** on more favorable terms than to any other class of buyers. We do not solicit dealers, but sell almost exclusively direct - to - consumers and through contractors.

To **contractors** we offer a special discount, and also a profit-sharing plan under which additional payments are made and which

enables contractors to make extra money, without loss of time.

When you want another furnace, ask us just what we can do for you. Free booklet, plans, etc.

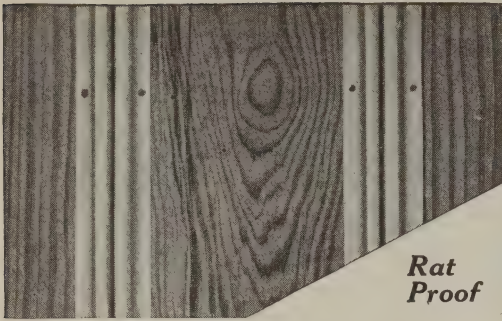
**Hess Warming & Ventilating Company**  
907 Tacoma Building Chicago, Illinois

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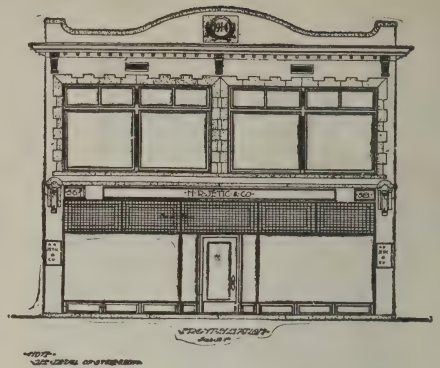
Rat  
Proof

## Metallic Batten Strips For Barn Siding

And other buildings where vertical siding is used. These Batten Strips expand and contract with siding; no warping, splitting or drawing off. Metallic Batten Strips make the building wind, rain and snow proof, always lay flat, do not interfere with sliding doors and add to the beauty of the building.

Write for prices and free samples

**Metallic Batten Company**  
Department M Owensville, Ind.



## WHEN YOU DESIGN A STORE FRONT LIKE THIS

Why don't you just specify "Petz Patent Store Front Construction including ventilated sash shall be used?"

You can leave it to us to provide a modern, sales-getting front — and a front which will get the lowest insurance rate for the plate glass.

Those are the bulls'-eyes for your client's satisfaction.

Send for catalog and put the store front up to us.

Detroit Show Case Co., 481 W. Fort St., Detroit, Mich.

## WAGNER STUDDING SOCKETS

### FOR CEMENT FLOORS

— the easiest, quickest, surest, most substantial method of anchoring studding to cement floors.

Takes but a minute or two to set them in the fresh cement, and once the cement is set, the Sockets hold forever. Easier, better and far more substantial than toe nailing to joist.

Protect bottoms of studding against decay and insure long life to the building. Use Wagner Studding Sockets for garages, barns, and all frame buildings with cement floor. **Your Dealer Can Supply You.**

Write for descriptive folder. We fill orders direct where we have no dealer.

**WAGNER MFG. CO.**  
Dept. E, Cedar Falls, Iowa

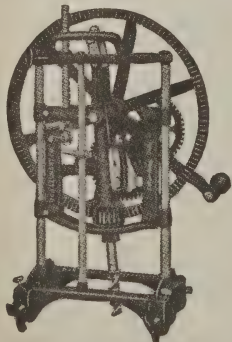
## GAS PLANTS for COUNTRY HOMES

EVERY suburban and country home, large and small, can have gas for lighting and cooking.

### MILBURN PLANTS

make gas which is better than city gas and costs no more. Machines are simple, automatic and durable. Write for Catalogue V-22.

**The Alexander Milburn Co.**  
Baltimore - Maryland



## 10 Days' Free Trial AT OUR RISK

You do not need to send us a cent until you have convinced yourself that the **Champion Mortiser** will cut a perfect mortise in two or three minutes.

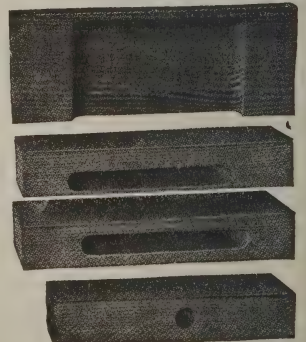
Ten days' test will prove its ability to save its total cost on the first job—before you buy it. You take no risk.

Can be used on any door lock, sash, screen frame, cabinet work, etc. Adjustable from perfect round hole to  $6\frac{3}{4}$ " slot.

### CHAMPION MORTISER

is equipped with ball bearings, large gears and automatic stop. Easy working. Cuts perfectly. Mortises in hard or soft wood, through knots, with or against the grain. No other tool required. Write today for circular and particulars.

**COLGAN MACHINERY & SUPPLY CO.**  
610 New Hayden Bldg. Columbus, Ohio



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stamped on the clamping beams, which clamping beams move parallel by turning a crank. All the operator does is to move the steel clamping block to the respective



marks, place the material and clamp up, by simply turning the crank a few times.

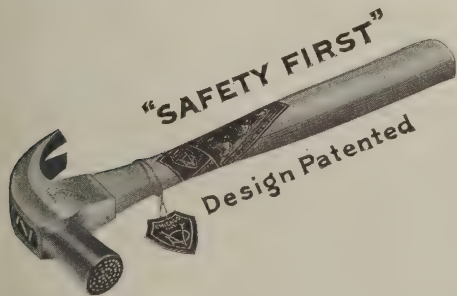
This special clamping bench and laying out table will take frames up to five feet wide and ten feet long.

A. N. Miller, 750 38th St., Milwaukee, Wis., is the maker. He will quote prices on this size or larger. The circulars he is mailing to contractors, and mill men describe also his sliding arbor cut-off saw, screen wire stretcher, and small moulding miter cutter.

### New Style "Safety First" Hammer.

"Safety First" Packing Hammers were designed especially to prevent accidents and to increase efficiency in the packing room, but carpenters have discovered that these hammers are just the thing for framing and rough work.

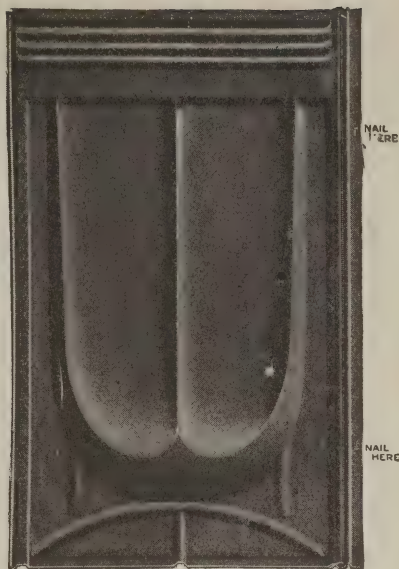
The roughened or corrugated face is not the ordinary criss-cross checking but a deep cut milled face that will not glance off the



head of a nail and will not wear smooth. The claw, like that in the "Vandor Vanadium" hammers, will draw a headless nail.

They are also made the same, being drop forged from solid tool steel and tempered

Advertisers' Section.



## Here's the Latest

Edwards "Ohio" Metal Shingle is the latest and best metal shingle product on the market today—barring none. The "Ohio" has a handsome novel design. The clean cut embossing can't be beat.

### Edwards "Ohio" Metal Shingle

The beautiful pattern is made in one size only—14x20 inches. Manufactured from the best quality Worcester Grade Terne Plate, painted or "Tightcote" galvanized

The "Ohio" has the patent interlocking device and every other good feature that has made Edwards Shingles famous

*Shall We Send Samples and Prices?*

**The Edwards Mfg. Co.**  
"The Sheet Metal Folks"

430-450 Eggleston Ave., Cincinnati, O.  
Largest Manufacturers of Metal Ceilings, Metal Shingles, Steel Roofing and Siding in the World

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# GENUINE BANGOR

--the Slate for ALL Roofs

To insist on "Genuine Bangor" Slate is to assure your getting the one really desirable roofing material. Our large facilities permit interesting prices and prompt delivery. Write us for more information on "Genuine Bangor" Roofing Slate, Structural Slate and Blackboards.

East Bangor Consolidated Slate Co., East Bangor, Pa.

## DO YOU KNOW

Mr. Home Builder, that the cellar of your residence can be made absolutely and permanently watertight by the simple application of 1" finish of Portland Cement with Bitu-Mortar Waterproofing Compound added, over the inside walls and floor?

Let us tell you about our products.

The Bitu-Mortar Waterproofing Company

**BITU-MORTAR**  
**WATERPROOFING**  
**WATERPROOFS PERMANENTLY**

Engineers, Contractors and Manufacturers

340-342 East 27th Street

New York, N. Y.

## The Only Roof You Can Afford to Consider

for pleasing results and endless freedom from roof troubles and costly repair bills, is

Red **SHELDONS** Purple  
Green **SLATES** Black

The use of any artificial substitute means endless expense and dissatisfaction. Our booklet "The Reason Why" tells every reason why *Sheldons Slates* on your roof will put dollars in your pocket. Post a postal and get posted.

F. C. Sheldon Slate Co. - Granville, N. Y.



## Make money faster and easier than you ever did

before, by handling W. & C. Metal Shingles. We have a special selling proposition to make to one live man in every town in the country, and its acceptance puts the acceptor in a position to make a great deal of money very easily.

## Walter's and Cooper's Metal Shingles

are proof against fire, wind, storm, snow, rain, lightning, rust and decay; will not curl, check, split, rot, crack, blow or drop off, and are long lasting. Cost no more than wood shingles. Ask for catalog and selling plan.

National Sheet Metal Roofing Co., 339-345 Grand St., Jersey City, N. J.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
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in oil, with the best kind of hickory handles.

The new hammer can be found at many hardware stores, but if the dealer cannot supply you, write direct to the Van Doren Mfg. Co., 225 W. Erie St., Chicago, Ill., for prices and circulars.

## Cornell Board for Interior Finish

The selection of Cornell Board for covering the walls and ceilings throughout the new and fashionable hotel built at Cedar Point, Ohio, indicates the value of that material for work of this character. It is



interesting to note that with unlimited means and the desire to use only the most satisfactory material, Cornell Board was used in this work.

Cornell Board is made by the Cornell Wood Products Co., 119 W. Madison St., Chicago, Ill., and the manufacturers are anxious to send samples and information to every one interested in this valuable building material.

## For the Barn Building Contractor.

The contractor who takes up any special line of work quickly realizes that he must do more than merely do the work when the owner wants it. In many cases he must call on the prospective builder and show him that it is to his advantage to build or repair and improve his buildings.

The farmer who has not kept up with the times soon finds that his barn and barn equipment is antiquated and that he is losing money by reason thereof. The contractor who has followed these pages realizes that proper barn equipment will be of immense value to the farmer and that the contractor who is able to convince the farmer of this fact stands a mighty good show of securing the contract.

Advertisers' Section



Office Building of W. C. Baumer, Syracuse, N. Y., roofed with Asbestos "Century" Shingles.

## Asbestos "Century" Shingles

*The Artificial Roofing Slate that Outlives the Building*

ONE thing we notice—and it happens so regularly that there must be sound reasons for it—

Just so sure as a contractor gets one roof of Asbestos "Century" Shingles up in his community, we receive frequent and increasing orders from him.

You might find it worth while to get in touch with Asbestos "Century" Shingles and learn *why* this is the fastest growing proposition in the roofing business.

Write us today for prices. Then feature the fact that you are in position to furnish your clients with this highest value in roofing material — Asbestos "Century" Shingles.

**KEASBEY & MATTISON, Factors**  
Dept. H, Ambler, Penna.

*Branch Offices in Principal Cities of the United States*

## Metal Columns Will Not Split

The checking, splitting, rotting and warping or opening of joints which sooner or later mars or destroys all wood columns can be avoided and the permanent beauty of the building insured by using

### UNION METAL COLUMNS

"THE ONES THAT LAST A LIFETIME"

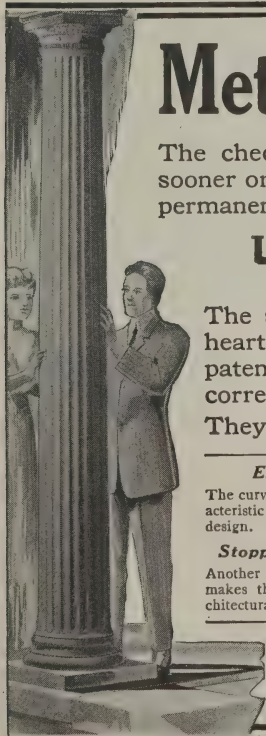
The shafts of these columns are built up of open hearth steel specially galvanized and so shaped by patented machinery that they are architecturally correct in every detail.

They are used for porches, pergolas, interiors and thousands of them have been installed on residences, hotels, apartments, schools, churches, and nearly every class of building.

Write for book of installations and detailed information.

*See Catalog in Sweet's*

**The Union Metal Mfg. Co.**  
CANTON, OHIO

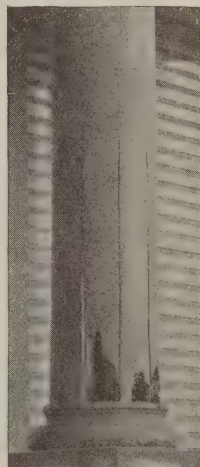


#### *Entasis*

The curving taper characteristic of classical design.

#### *Stopped Flutes*

Another detail which makes the column architecturally correct.



An unsightly wood column

PASTE THIS DOME  
WRITE TO ADVER-

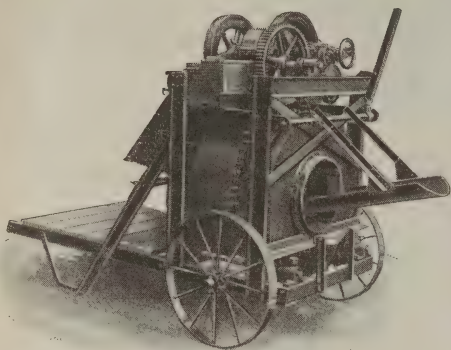


ON LETTERS YOU  
TISERS. IT HELPS.



# Bid Low

*on that concrete job*



Make good on your bid  
by using a

## Sackett - Chicago

*"Low-Charge"*

### Batch Mixer

☞ It's a general builder's mixer, for foundation work, building silos, laying sidewalks, block factory.

☞ An all-around mixer for big and little jobs; easily wheeled around; pours direct to forms.

☞ A mixer every builder needs.

**Price** With  $3\frac{1}{2}$  Horse Power  
New-Way Motor **\$275**

*Write for information*

**H. B. Sackett Screen & Chute Co.**

1689 Elston Avenue  
CHICAGO

199 Medford St., Charlestown, Mass.



FASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.

The West Bend Barn Equipment Co., 211 Water St., West Bend, Wis., have a catalog showing their extensive line of barn equipment. It will enable the contractor to talk intelligently on this subject and to show the farmer where he will make money by the installation of up to date equipment in both his old and new barns.

### Edward's Steel Trucks.

Every contractor realizes the value of the general purpose truck shown with this article. It takes the place, many times of a cart and is convenient for handling a great variety of material. It can be used in the



shop and on the job as well as carrying material from one to the other.

The Edwards Mfg. Co., 430-450 Eggleston Ave., Cincinnati, O., in a recent circular show this and a number of other excellent trucks which may be of use to the contractor and builder as well as those who have a variety of boxed material to handle. The circular will be sent on request and should prove of interest and value.

Advertisers' Section.



## Real Art In Metal Work

We offer you a variety of exclusive stock pieces and designs to select from, that cannot even be approached in artistic merit or numbers by any other manufacturer in the world, or we will produce faithfully reproductions of sculptors' own models or artists' own designs.

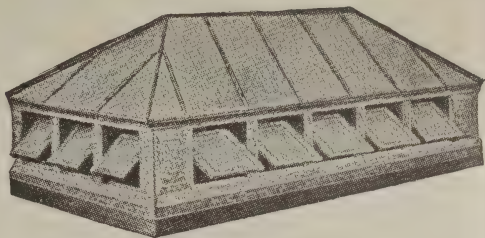
### Mullins Sheet Metal Statuary

while costing far less, rivals in appearance and endurance the finest cast or sculptured work.

We manufacture and can make prompt shipments of Metal Tile Roofing, Skylights, Cornices, Finials, Building Fronts, Capitals, Fireproof Windows and Sheet Metal Ornamental Work of every description. Special discounts to the trade.

Write for catalog or send your drawings for estimate.

**The W. H. Mullins Co.**  
210 Franklin St., Salem, O., U.S.A.



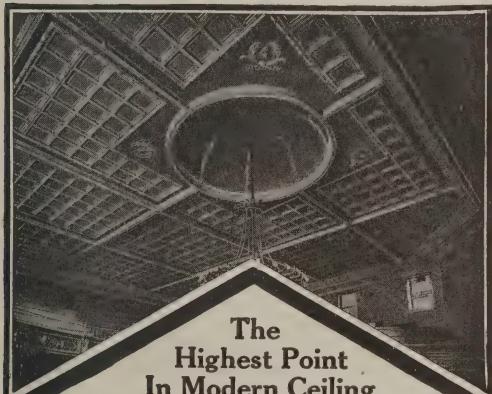
## Do You Install Willis Skylights?

If it's for a small residence—or a large factory—a Willis Skylight fills the bill exactly; made in all styles.

Fine for the contractor, too, as any ordinary workman can erect one in an hour or less. A hammer and screwdriver are positively the only tools needed. No putty, solder or experience necessary. Guaranteed watertight, and cannot sag, buckle or spread. Largest possible glass area.

Our big catalog No. 6 is sure to interest you; write for a free copy.

**Willis Mfg. Co., Galesburg, Ill.**  
Manufacturers Fireproof Windows, Ventilators, etc.



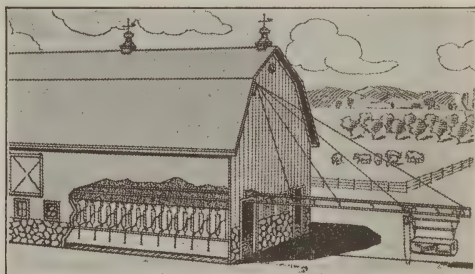
### The Highest Point In Modern Ceiling Construction

is found in Berger's "Classik" STEEL Ceilings. These ceilings are unsurpassed for beauty of design, durability and ease of application. They have prevented many big fires by confining the flames to one room. Used in public and private buildings of every type and size. Never crack, sag or fall.

Our new close-fitting bead and never-slip nailing button save 25% to 40% in erection costs. Send a card for a copy of our handsome 148-page catalogue. Patent Pending

**THE BERGER MFG. CO., Canton, Ohio**

For the best service address nearest branch:  
New York Philadelphia Minneapolis Boston San Francisco St. Louis Chicago  
Export Department: 11th Ave. and 22nd St., New York City



## ARCHITECTS AND BARN BUILDERS

Add to your profits by specifying and installing the Libbey Line of Barn Equipments. Also by securing our aid in planning out the most practical, up-to-date barn for each farmer's needs.

Libbey service and equipment will help you get contracts for barn building right in your locality—contracts that pay.

Farmers need modern, sanitary barns; you need the business; we need your help in selling our modern barn equipment. Let's get together.

Information on what we can do for you—and what you can do for yourself—will be sent on receipt of postal card.

**C. A. LIBBEY COMPANY**  
182 Marion Street Oshkosh, Wisconsin

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ON LETTERS YOU  
TISERS. IT HELPS.



### Fly Time Brings Screen Business.

Spring time is fly time; summer is mosquito time;—the time when those pesky little nuisances get right on the job. The only thing that equals their persistence is the way a wide-awake carpenter goes after business.

Fighting flies seems a useless task. But there's money in it for you carpenters if you defend your clients from those flies. Do it with a good set of window, door or porch screens.

Take pains to make a well-fitting solid frame and then cover it with a good wire cloth. An otherwise neat job is often spoiled by poor screening; too much stretch here, too little there and you get a saggy

For durability and beauty, Pearl Wire Cloth is suggested as being the equal of any made, and better than most.

The wire is coated with a metallic substance that defies rust. This coating makes the wire a beautiful pearl gray color that blends nicely into any other color. This makes the screening of a house unobtrusive. It doesn't show like a black screen does. Age does not affect Pearl Wire Cloth. It becomes more beautiful with age. There are two grades of this screening—the regular grade for windows and doors and the extra heavy grade for porch screening and in other places where great strength is needed.



uneven job that doesn't help your reputation.

By all means use a good wire cloth that will stretch evenly in all parts and draw snugly in the frame. Then you know you have done a good job. For all screening purposes, Pearl Wire Cloth has been highly recommended. Many of our carpenters have found it ideal.

Pearl Wire Cloth will not rust, and rust as you know takes the life out of the ordinary screen in one season—sometimes less.

Before you screen one window or door this spring, get a sample of Pearl Wire Cloth and see what you think of it. Samples can be obtained free from Gilbert & Bennett Mfg. Co., Dept. A25—38 S. Dearborn St., Chicago. You'll know "Pearl" by the two copper wires in the selvage and by the tag bearing the name. It is certain that if you use Pearl Wire Cloth on your jobs, you'll get all the screen business in your town. Get the samples anyway; a post card will bring them.



## LOUDEN BARN PLANS

LOUDEN MACHINERY COMPANY  
FAIRFIELD, IOWA

LOUDEN MACHINERY CO.,  
5602 Fourth St., Fairfield, Iowa.

Gentlemen: Please send me free of charge, a copy of your book LOUDEN BARN PLANS.

Name .....

Town ..... State .....

Note.—If you wish complete set of catalogs check this square ☐

## Will You Accept this \$1.00 Book of Barn Plans Free?

**Louden Barn Plans**, compiled and published by the Louden Machinery Company at a cost of more than \$3,000, contains the most valuable collection of practical barn plans ever assembled in book form.

The book has 96 pages, printed in two colors and beautifully illustrated. Its 194 plans, drawings and photographs illustrate practically every phase of modern barn construction, ventilation and equipment.

The primary mission of **Louden Barn Plans** is to encourage the building of better barns. Incidentally it will put you in touch with the greatest line of modern barn equipment in the market. This book does not describe the line, however, nor does its use obligate you in any way to specify Louden equipment.

*You need this book. It is stored with sound information acquired by our barn experts in a lifetime of experience.*

The publisher's price for **Louden Barn Plans** is \$1. It's free to you if interested in barn construction. Fill out coupon or mail a postal today—you might forget it tomorrow.

Note.—If you are interested in modern, sanitary barn equipment, check the square in the coupon or ask for complete set of catalogs. The Louden line includes stalls and stanchions, litter carriers, feed carriers, hay tools, barn door hangers, and barn specialties.

**LOUDEN MACHINERY COMPANY**

5602 Fourth Street

Fairfield, Iowa



## DREW STALLS AND STANCHIONS

**Are the World's Best**

When you get a contract to build and equip a barn, equip it *right*. Recommend "DREW" Sectional Steel Stalls and Stanchions. Drew equipment contains special features found in no other line. Drew Stall Frames adjust instantly without removing a single bolt, giving perfect alignment of cows on gutter; also special adjustment for different neck widths from calf to grown-up.

Instead of the usual cowstop, Drew stalls have one on each side, making doubly sure that cow cannot miss the stanchion; stops fold against partitions out of the way.

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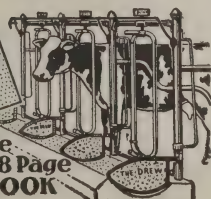
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Waterloo, Wis.

Eastern Branch:  
Rome, New York

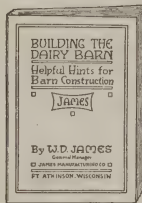
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You will be interested in reading "Building the Dairy Barn," it tells many of the things learned by W. D. James—America's foremost dairy barn designer. It will help you make more money.

It tells about the new plank frame construction, the famous King system of ventilation, perfect lighting, proper width and arrangement. It tells about stable floors, site, size, appearance, design, drainage and equipment. And it shows four floor plans of barns that have attracted wide-spread attention.

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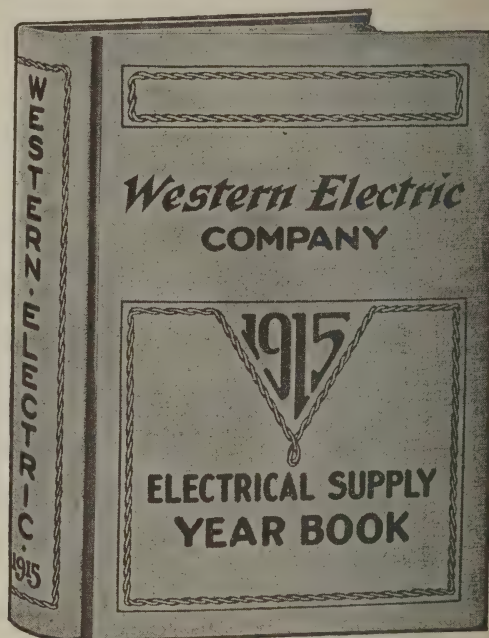
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## Western Electric Inter-Phones.

The inter-phone system designed by the Western Electric Co., 463 West St., New York, is designed to furnish the most satisfactory means of communication between the various rooms of a building or between separated buildings in the immediate neighborhood. A great many systems applicable for various requirements are shown in the 1915 Electrical Supply Year book issued by the above Company.

Inter-phones will permit the contractor to talk from his desk to any part of his shop or in connection with the new build-



ing which he is installing he can give the owner ready means of communication all over the place. The extremely low price at which these outfits can be secured should make them an ideal feature for the contractor to incorporate in practically every building which he erects. He can arrange a line from the farmer's house to his barns or to the neighbors or in the city house can easily connect the house with the garage. An inter-phone will save many steps and frequently much time and inconvenience. The various styles of inter-phones are fully shown in the above mentioned year book and there are also shown numerous wiring systems to be used in connection with them.

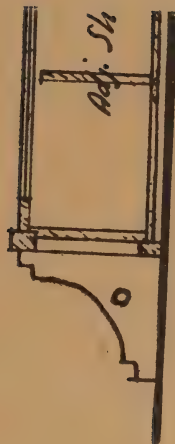
Advertisers' Section.

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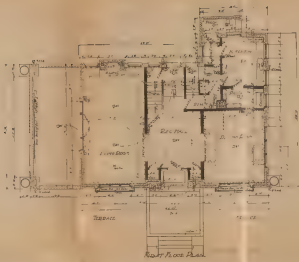
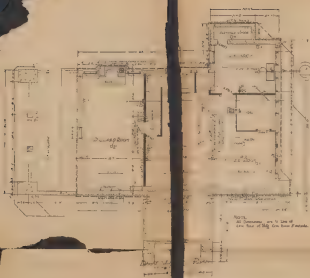


ON LETTERS YOU  
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SE.







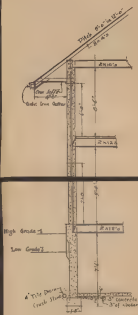
# SUPPLEMENT TO **THE NATIONAL BUILDER** FEBRUARY, 1913

NATIONAL BUILDER DESIGN NO. 106

Scale for plan and elevation: 1 inch equals 8 feet. Roofing: 1 inch equals 1 foot. Details: 1/4 inch equals 1 foot. Section: 1/4 inch equals 1 foot.

FOR DESCRIPTION AND ESTIMATE SEE PAGE 55

This House is Shown in Colors on Front Cover



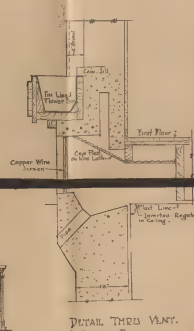
TYPICAL SECTION THIRD FLOOR.



A IN DENT.



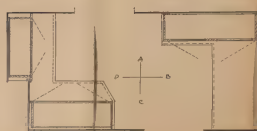
A IN KITCHEN CASE.



DETAIL THIRD FLOOR & LOWER BOX.



D IN DENT.



DENTISTRY DETAIL.



SECTION IN D.



Used in Living & First & Second Floor Hall.

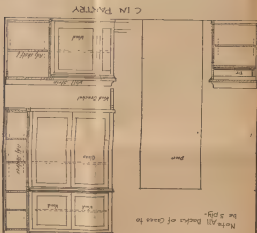
CHAIR EASEL.



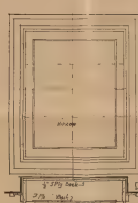
STOOL & APRON.



PICTURE R. WOOD.



SECTION IN C.

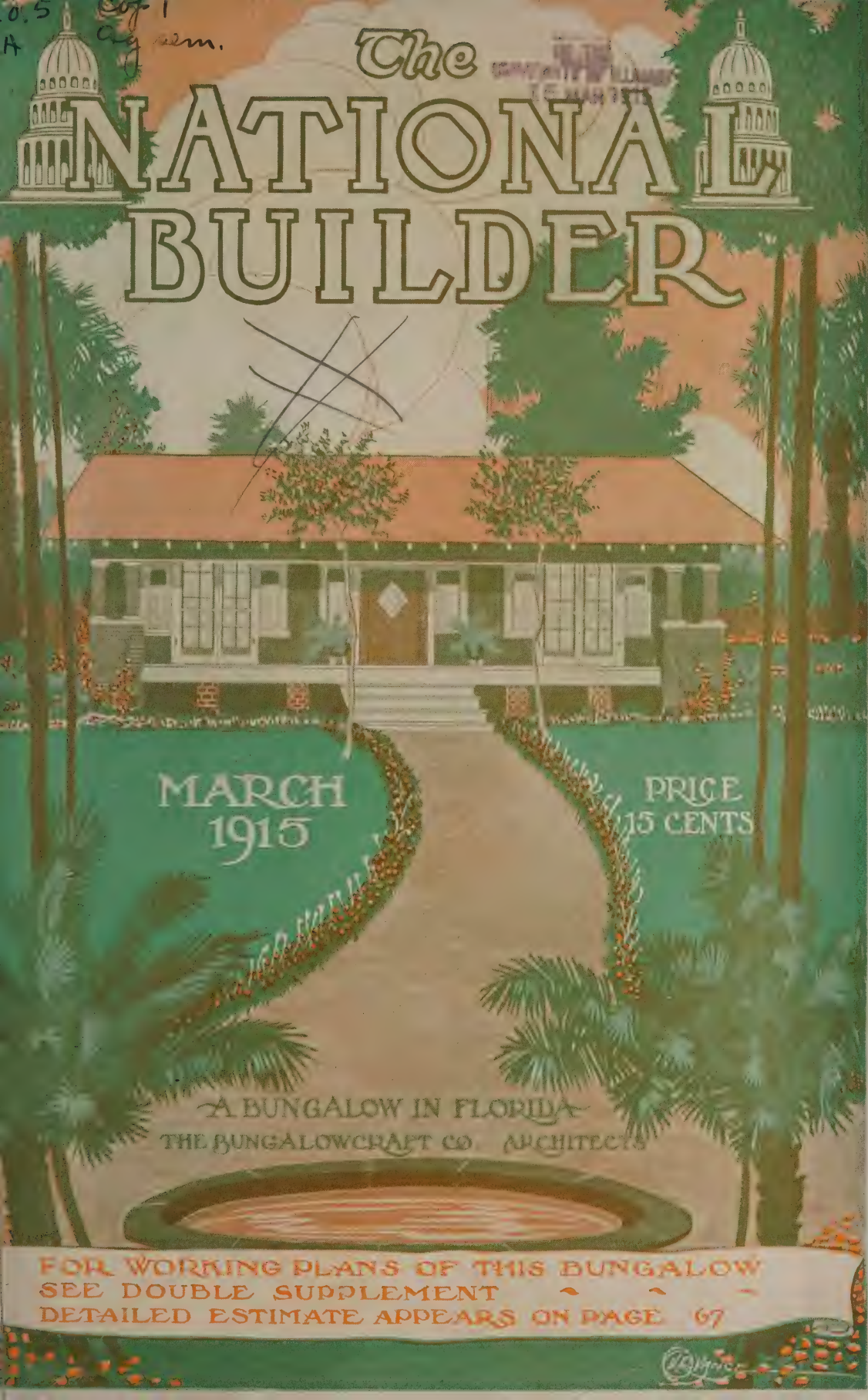


DETAIL OF MED CASE.



KITCHEN CASE.





0.5  
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A  
The  
NATIONAL  
BUILDER

MARCH  
1915

PRICE  
15 CENTS

A BUNGALOW IN FLORIDA  
THE BUNGALOWCRAFT CO. ARCHITECTS

FOR WORKING PLANS OF THIS BUNGALOW  
SEE DOUBLE SUPPLEMENT  
DETAILED ESTIMATE APPEARS ON PAGE 67

Patent



# A Special Message Addressed to You.....

If you had assembled all the facts pertaining to all the pines, you would select **Arkansas Soft Pine** for all manner of interior woodwork, and get your "Pick of the Pines." Your conclusion would be the same as that reached by United States Government officials, if you, as they, were absolutely unbiased and guided by the facts your investigation brought to light.

Predicted on the investigations that have been made for you by Uncle Sam, you should employ **Arkansas Soft Pine** for interior and exterior use for these reasons:

## For the Interior

No other wood shows such a variety of pleasing figure. Some of it is splashy and bold; some of it has been delicately engraved by nature, the greatest of all artists.

Its uniform texture insures the even absorption of fillers, stains or dyes, and a proper finish with shellac, varnish or wax. Properly treated an effect is secured that is unsurpassed by the finished appearance of any other wood.

## For the Exterior

**Arkansas Soft Pine** contains practically no rosin or resinous oils. There is a notable absence of pitch streaks. It does not gum the carpenter's tools or power machinery.

Open cells permit of the absorption of sufficient of the oil and pigment to bind paint firmly to the surface to which it is applied. The result is that **Arkansas Soft Pine** holds paint. It is easy to work and worth working.

These are elemental **Arkansas Soft Pine** facts with which you should be familiar, because the difference between the cost of this wood and others not so good is so slight that you cannot afford to take a chance.

*For Interior Woodwork there is no comparison between the value of **Arkansas Soft Pine** and other soft woods.*

**Special for You:** We have a limited supply of finished samples. We will honor requests in the order received. Send for yours.

**Arkansas Soft Pine Bureau**  
608 South Dearborn Street Chicago, Illinois

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# THE NATIONAL BUILDER

Vol. 57 (51st Year)

Chicago, March, 1915

No. 3



Bungalow fitting well into a Florida Landscape.

## NATIONAL BUILDER DESIGN NO. 392.

The Bungalowcraft Co., Architects, Los Angeles, Cal.

For Floor Plans, Sections, Details and Full Working Drawings, see Double Supplement of this month. Estimated Cost \$2,206.44.\*

# Estimate of a Bungalow in Florida

I. P. Hicks

EXCAVATING.		124	2/ 4x14 ft. ceiling joists.....	1,116	
10 yards excavating for wall and piers, 35c.....	\$ 3.50	78	2/ 4x16 ft. outside studs, to cut in two .....	858	
MASONRY.		30	2/ 4x14 ft. gable studs.....	270	
4,200 brick laid in foundation wall piers, \$13.....	54.60	86	2/ 3x16 ft. partitions to cut in two .....	708	
20 lineal feet, 8x8 flue, 80c.....	16.00	16	2/ 4x16 ft. plates.....	176	
		18	2/ 4x12 ft. plates.....	144	
Total .....	\$70.60	20	2/ 3x16 ft. plates.....	160	
LUMBER BILL.		16	2/ 3x12 ft. plates.....	96	
	Feet.	44	2/ 4x26 ft. rafters.....	748	
10 4/ 8x16 ft. mud sills.....	420	20	1/ 4x16 ft. collar ties.....	107	
4 4/ 8x16 ft. floor beams.....	84	20	1/ 4x10 ft. rafter braces.....	130	
8 4/ 8x12 ft. floor beams.....	256	24	1/ 6x12 ft. braces.....	144	
54 2/ 8x16 ft. floor joists.....	1,134	32	1/ 4x12 ft. bridging.....	128	
27 2/ 8x14 ft. floor joists to cut in two for center span.....	513	4	2/10x20 ft. porch beam.....	132	
		2	2/10x16 ft. porch beams.....	54	
*Materials are figured at Omaha prices. Carpenter labor figured at 50 cents per hour.		Total ft. framing lumber.....			7,378



7,378 ft. framing lumber, \$26.....	\$191.82	6 Gable beams, 6x6x3 ft., 50c....	3.00
2,250 ft. 5/8x6 inch, \$32.....	72.00	2 Lattice vents in gables, \$2.50..	5.00
1,450 ft. 1/4x12 to 16 ft. No. 1 flg., \$40 .....	58.00	2 Lattice vents in foundation, \$1	2.00
2,200 1/4x12 to 16 ft. No. 2 roof shtg., \$26.....	57.20	2 Outside door frames, 4'0"x6'8" side lights, \$7.....	14.00
20 M shingles, \$4.....	80.00	2 Outside doors, 5'0"x6'8", with side lights, \$7.50.....	15.00
420 ft. 1/4x16 ft. No. 1 flg. for porches, \$40.....	17.60	2 Twin window frames, 8'0"x4'6", each \$4.50.....	9.00
400 ft. 5/8x4"x16' ceiling for porches, \$28 .....	11.20	1 Twin window frame, 3'0"x3'0", each.....	4.50
700 ft. 3/4x4"x12 to 16 ft. ceiling for cornice, \$32.....	22.40	1 Window frame, 3'0"x4'0".....	2.25
12 1/4x16 ft. finish, \$40.....	2.56	1 Window frame, 3'0"x3'0".....	2.00
12 1/2x16 ft. finish, \$40.....	1.28	1 Window frame, 3'0"x3'6".....	2.00
4 2/10x26 ft. finish, \$50.....	8.60	1 Window frame, 1'0"x2'0".....	1.75
3 2/12x12 ft. finish, \$50.....	3.60	8 Side light sash, 1'6"x4'6", \$2.50	20.00
8 1/10x16 ft. finish, \$45.....	4.86	4 Windows, 3'0"x4'6", \$3.....	12.00
6 1/8x16 ft. finish, \$45.....	3.60	3 Windows, 3'0"x3'0", \$2.....	6.00
2 11/8/12x12 ft. finish, \$45.....	1.35	1 Window, 3'0"x4'0".....	2.25
10 1/12x12 ft. finish, \$40.....	4.80	1 Window, 3'0"x3'6".....	2.10
<hr/>		1 Window, 1'0"x2'0".....	1.00
Total lumber bill.....	\$540.87	2 Set sliding door jambs, 7'0"x6'8", \$1.20.....	2.40
MILL WORK.		1 Cased opening, 2'8"x6'8".....	.70
6 Porch columns, 8x8x3 1/2 ft., \$1.75 .....	\$ 10.50	2 Set jambs, 2'8"x6'8", 70c.....	1.40
		3 Set jambs, 2'6"x6'8", 70c.....	2.10
		3 Set jambs, 2'4"x6'8", 70c.....	2.10



The Living Room looks towards the Front and Dining Room.



The Den with Bed under Desk. Note the Drawers under the Stair Treads.

1 Front door, 4'0"x6'8"x1 $\frac{3}{4}$ "...	12.00	Kitchen cupboard.....	18.00
4 Doors, 2'6"x6'8"x1 $\frac{3}{4}$ ", \$6....	24.00	Small cupboard.....	7.00
2 Doors, 2'0"x6'8"x1 $\frac{3}{4}$ ", \$5....	10.00	Screens .....	50.00
4 Doors, 3'6"x6'8"x1 $\frac{3}{4}$ ", \$7.50..	30.00	Steps with drawers under.....	12.00
2 Doors, 2'8"x6'8"x1 $\frac{3}{8}$ ", \$2.80..	5.60		
3 Doors, 2'6"x6'8"x1 $\frac{3}{8}$ ", \$2.70..	8.10	Total mill work.....	\$467.12
3 Doors, 2'4"x6'8"x1 $\frac{3}{8}$ ", \$2.60..	7.80		
74 Plinth blocks, 5c.....	3.70	CARPENTER LABOR.	
480 ft. 12 ft. casing for doors, 2 $\frac{1}{2}$ c	12.00	7,378 ft. framing lumber, \$10.....	\$ 73.78
180 ft. 10 ft. casing for windows,		2,250 ft. siding, \$10.....	22.50
2 $\frac{1}{2}$ c .....	4.50	Extra for siding porch pedes-	
244 ft. head casing, 2 $\frac{1}{2}$ c.....	6.10	tals .....	5.00
240 ft. fillet, $\frac{1}{2}$ c.....	1.20	1,450 ft. flooring, \$15.....	21.75
240 ft. cap mold, 2c.....	4.80	Planing joints.....	8.00
80 ft. window stool, 2c.....	1.60	2,200 ft. roof sheathing, \$8.....	17.60
80 ft. apron, 2c.....	1.60	1,520 ft. porch floor, ceiling and	
252 ft. window stops, 14 ft., 1c.....	2.52	cornice ceiling, \$15.....	22.80
342 ft. door stop, 14 ft., 1 $\frac{1}{4}$ c.....	4.27	188 Lineal ft. cornice frieze and	
260 ft. inside base, 3 $\frac{1}{2}$ c.....	9.10	large board, 10c.....	18.80
260 ft. floor mold, $\frac{1}{2}$ c.....	1.30	54 ft. porch beam, 10c.....	5.40
180 ft. picture mold, 1 $\frac{1}{4}$ c.....	2.25	Porch steps.....	4.00
200 ft. $\frac{7}{8}$ quarter-round, $\frac{1}{2}$ c.....	1.00	Back porch rail.....	2.00
126 ft. $\frac{7}{8}$ cove mold, $\frac{1}{2}$ c.....	.63	Setting frames.....	6.60
1 Medicine cabinet.....	10.00	Finishing, 45% cost of millwork...	210.20
Buffet .....	35.00		
Linen case .....	8.00	Total carpenter labor.....	\$418.43
Dresser .....	20.00		
Sink case.....	30.00	THE COMPLETE ESTIMATE.	
		Excavating .....	\$ 3.50



Masonry .....	70.60	Electric wiring.....	38.00
Lumber bill.....	540.87	Hardware and nails.....	45.00
Millwork .....	467.12	Tin work (no gutters).....	10.00
Carpenter labor .....	418.43	Painting .....	120.00
Disappearing beds.....	75.00	Incidentals, 5%.....	105.06
Plastering 418 yards, 27c.....	112.86		
Plumbing .....	200.00	Total estimate.....	\$2,206.44

## How To Use This Estimate

This estimate is figured at Omaha prices, with carpenter labor at 50 cents an hour. To use this estimate for other localities the reader will note that the price of each grade of lumber, as well as all other materials, is given in the regular trade units, that is per thousand feet for lumber, per thousand for shingles, per cubic yard for excavating, etc.

It is a simple matter to substitute the prices current in your vicinity for the

prices given in this estimate and to extend the quantities and so determine the exact cost for your neighborhood.

For instance, framing lumber may be \$30 per thousand in your town while it is figured in this estimate at \$26. Simply extend the number of feet at \$30; labor may be more or less. The owner may want to contract for the furnace or plumbing separately. The detailed estimate makes these changes possible.

## The Bungalow as a Home

EVERYONE thinks of a bungalow as something a little different. Why should it differ from a Cottage? Or from a House? Or from a Residence? And does it?

One need not travel back more than a few years to see why a Bungalow is popular. The Bungalow Idea originated in the West, where Sociability is supposed to be above Society. The necessary adjuncts to Social Duties being absent, there is in consequence a freedom not generally present. It is

nearer to being in a Summer Camp the year round.

But even the popular conception of the Bungalow fails when the true artist begins to think over the project. An artistic effect is obtained on the exterior by getting away from the conventional materials and finishes. Rough boards and shingles take the place of finishing lumber, while stains replace paint, or even Time decorates the clean surfaces.

In the Interior there is further room for



The Garden Side of the Bungalow.



The Living Room looking towards the Rear and Den.



The Dining Room looking through to the Kitchen, showing the Buffet and Bed under it.



Ideas. Built in Furniture, often Home-Made takes the place of movable chairs, tables, sideboards, cupboards, etc. In one way everything is simplified, to provide the maximum *comfort* for the least *labor*.

Take this Florida Bungalow for example. Not a great deal is spent on the exterior and yet it is positively not a Cottage or a House. It is a Bungalow and cannot be called anything else. It lends itself to the landscape, and in a few years will appear as part of it.

But if the exterior is satisfactory, how about the interior? The plans show the arrangement while the photos will give one an excellent idea of the finished appearance. The use of disappearing beds

is new to many sections, but there is no insuperable objection to their use almost anywhere. The arrangement has the quality of furnishing two extra rooms for very little space.

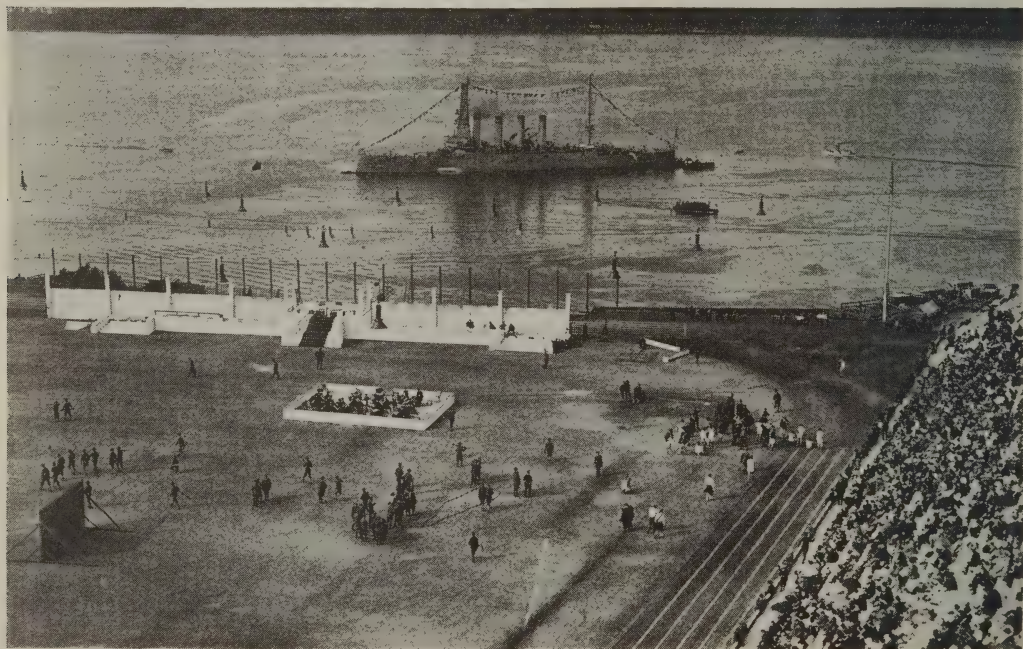
It is not the number of rooms, nor their size, that makes or mars a home, but rather their appearance and use. A closed piano is about as effective in subduing conversation as a muffler, while drawn curtains and shades drive company away just as effectively as a Smallpox sign. By all means let the House or Cottage or Bungalow show what it is and be made for some visible purpose. Then it will be successful from the Landscape, the Artistic and the Social view point.

## A Modern Stadium

Monroe Woolley

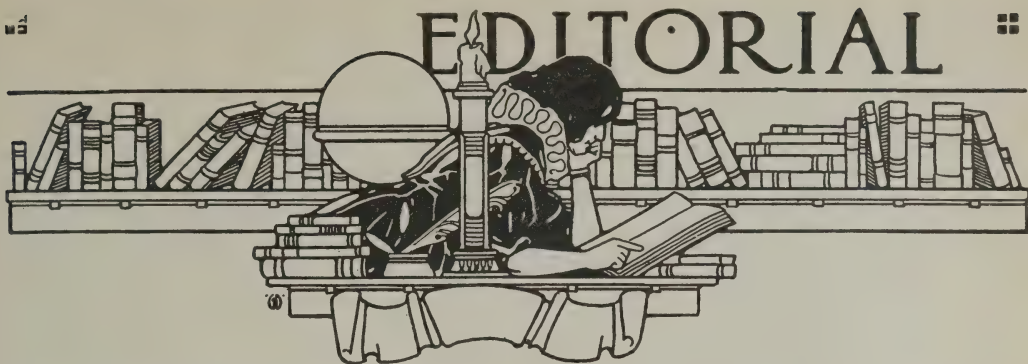
CITIES built on hilly sites are going in for stadiums similar to those used in olden times. Any natural ravine, or valley, within the city limits is easily and economically built into a vast open-air amphitheater for holding all sorts of outdoor carnivals, by the aid of cement. The sloping sides of the ravine are fitted with tiers of seats, while the bottom is leveled off as a field for games and athletic events. Open-air operas and theatricals are also staged in

the stadiums. Tacoma, Wash., was one of the first—if not the first—to build a stadium, and perhaps nowhere at present is there a better type of this sort of construction. The Tacoma stadium opens at one end on the beach, thus making it possible for warships and pleasure craft to anchor off the stadium during periods of entertainment. Not to be outdone by her neighboring city, Seattle is going in for a stadium that will have much merit for size, location and beauty.



Tacoma's Stadium on a Field Day.

# EDITORIAL



The pressure of idleness in the building trades that came with the war, is gradually relaxing.

\* \* \*

Business is gradually "picking up," and the ranks of the unemployed are thinning down accordingly.

\* \* \*

In England it is becoming difficult to find men enough to do the work required, and in this country, in many towns and cities, every man seems to have something to do. Indeed, in some places, it is difficult to get a man to work for you.

\* \* \*

The Annual Exhibition of the Architectural League of New York, which opens on the 7th of February and remains open to the 27th of the same month, in the Fine Arts Building of that City, gives promise of being the most interesting Exhibition ever held by the League, and will be well worth visiting by all the Art lovers. As heretofore the Exhibition will be illustrative of Architecture and the allied arts. It will consist of drawings and models of proposed or executed work in structural, decorative, and landscape architecture; sketched and finished examples of decorative paintings: and monumental sculpture. It is also proposed for this year, no full-sized portraits, or statues will have a place unless such are especially solicited by the jury of selection. The usual medal of honor will be awarded by the League in Architecture, Paintings and Sculpture, providing the juries consider the work is of sufficient merit to justify the awards. This is the thirtieth annual Exhibition by the League and will undoubtedly show a big improvement in number and quality over all preceding Exhibitions. It already makes

as good a showing as many noted ones given in some of the cities of Europe.

\* \* \*

The Borough of Brooklyn, N. Y., has built three apartment houses which are devoted to the housing and boarding low-salaried workingmen. The rentals run from \$22.00 to \$30.00 a month, which is somewhat too high for a single individual, but the compensation is comforts, privacy, chances to economize by preparing food in the "Kitchenettes" which are provided with each compartment, and which proves more economical than the average rooming-house, with the necessity of taking meals at boarding-houses or restaurants. These apartments contain one, two, or three rooms with "Kitchenette" attached, are unfurnished, and are directly connected with a dining hall, where each resident must take at least at a cost of from \$3.50 to \$4.50 a week. This method of housing the respectable poor mechanics, or other workers, should be worthy of imitation in other cities throughout the country, where the classes named are exceptionally large. Men having money to invest, can place it in a safe place, and render a good service to a whole lot of deserving fellow citizens, without running much risk. Young fellows, in the various trades, prefer having their own rooms, and it is much better for their welfare, and moral health.

\* \* \*

Regarding Workmen's Compensation, there seems to be various ideas, and because of this variety, we are inclined to believe that it is a question which ought to be mutually left for the Federal Government to deal with. A list of possible accidents that might occur, along with their possible results and consequences, could be made and



a minimum and a maximum amount of compensation named for each case, and other considerations that would necessarily crop up, could be discovered, until some regular universal system, acceptable to all the States might be decided upon. If this cannot be done then decide on a maximum and minimum sum for each case, which must be adhered to if the case is adjudicated. The "come-and-go" margin might fairly be wide enough to cover all conditions. If a difference between employed and employer could be settled by mutual consent, so much the better, but under no circumstances should the award be greater than the maximum, or less than the minimum. Of course, this is only a rough suggestion, but it seems to us, it can be made to fit every and all conditions of the workman's compensation "Idea."

\* \* \*

A "Sawdust Floor" is now a common thing where Sawdust is plentiful. Sawdust has been used for covering floors in some places for over a century. Meat shops, beer gardens, and what was dearer to the boy's heart, arenas of the traveling circus, were often covered an inch deep or more, and served an excellent purpose. What will be new to many is to be made aware of the fact that sawdust is now employed in making solid floors, when mixed with lye of a certain strength. The mixed composition is somewhat like ordinary mortar which is laid on a prepared floor of rough boards, from one to five inches thick. The thin layer of this mixture may be spread over the rough floor by aid of a plasterer's "float" or "trowel," but the thicker layer must be tamped with a flat faced "tamper." A small metal one is preferred, though a hardwood block with a smooth surface answers very well. The top surface of the composition must be good and strong enough to prevent vibration or springing of the whole floor. The composition should be finished up close to the base boards, and the door and window trim. As there is no shrinkage of material, the floor remains perfect when dry and can be finished off and polished in due time to suit the taste of the proprietor. The sawdust must be dry and clean of impurities,

before the lye is poured into it. A mortar bed of the usual size and form may be used, and the preparation should be made under cover away from rain and sun. It must be well incorporated with a plasterer's hoe or rake, or other suitable implement, and laid on the work in the usual way. The dry sawdust will require about five or six pails of lye water for every fifty-five pounds of dry pine sawdust, and some less for hardwood sawdust. A few pounds of honey well mixed with the sawdust, will tend to hold the particles together. While in a soft pasty state the floor can be ornamented or inlaid with blocks of wood, and made to look very handsome when polished or coated with varnish.

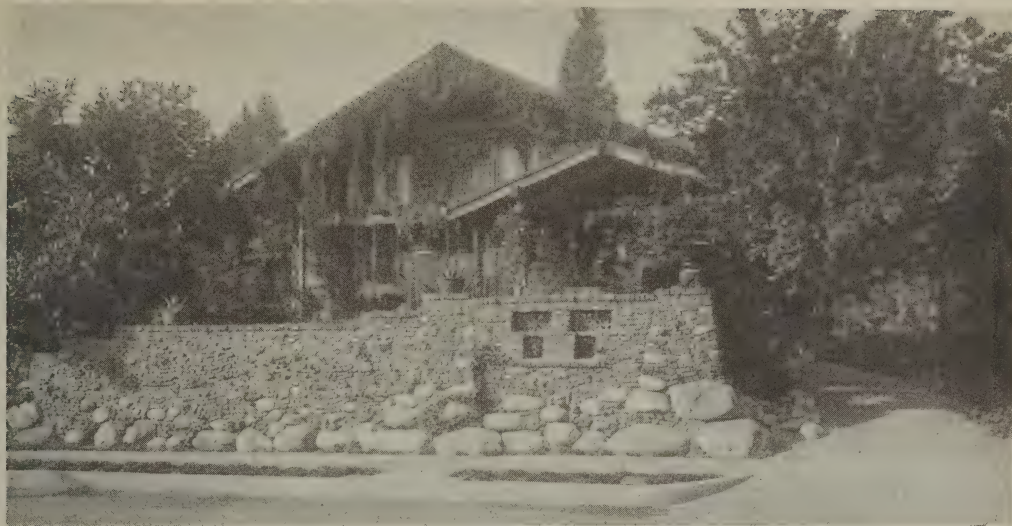
\* \* \*

The city council of Minneapolis, Minn., has adopted an ordinance limiting to two and one-half stories the height of all frame buildings within the city limits. The measure also requires private hospitals to be housed in buildings, of fireproof construction, and prohibits the use of coal or wood stoves in garages or other buildings where gasoline is stored.

\* \* \*

In the laying of the brick floor of the completed portion of the quay wall at the Balboa terminals, a squad of five West Indian masons, serving in relays, three men working at the same time, with two resting in reserve, laid in one day of 10 working hours, a total of 96,000 bricks. The entire gang, including the white foreman, Mr. Park T. Andrew, and the men engaged in handling the bricks from the cars, mixing and carrying mortar, etc., consisted of 67 men.

The masons laid the paving between the inner rail of the track along the face of the wharf and the inner coping, a width of 50 feet, over a distance of over 400 feet, covering an area of approximately 20,000 square feet. Counting five men in the squad, each laid at the rate of 1,920 bricks per hour, or 32 per minute; three men being actually at work, the bricks were laid at the rate of 3,200 per man per hour, or 53.33 by each man each minute. The masons were paid 13 cents per hour.



Field Stones used in Garden Wall.

## Interesting Uses of Field Stones

*E. I. Farrington*

IT is only of late years that the architectural possibilities of field stone have come to be recognized. Of course, such stones have been used for structural purposes for generations, but as a rule only in very rough ways. It has remained for California architects to develop some entirely new ideas along this line. Results have been achieved which are as interesting as they are unusual.

One case in point is found in the construction of a garden wall in Pasadena. This wall is made of field stones and clinker brick in combination, there being a course of large stones at the bottom of the wall, while smaller specimens are distributed among the bricks. The latter are bonded in such an irregular fashion that the plan is perfectly feasible. The effect is exceedingly unique and, under the circumstances,



An Ornamental Entrance.



decidedly pleasing, for the house itself is a bungalow and everything about the grounds is of an informal character. It is safe to say that what has been accomplished in this instance is not to be duplicated anywhere else in the country.

In another case, field stones have been used in connection with cement in constructing a huge exterior chimney at the rear of the house. The base of the chimney is broad enough to accommodate a large fireplace and is made entirely of stones built up in such a way that the mortar binding them together hardly shows. As the chimney grows narrower, cement has been brought into use, but numerous stones of different sizes are to be seen scattered through it.

Above the roof the chimney is entirely

of brick except for an occasional stone inserted in irregular fashion to give it character. This chimney reveals the resources of the architects, Greene and Greene, and shows a style which undoubtedly will prove popular among home makers with a liking for the unusual.

Probably the first stone walls in this country were built when the early farmers of New England began to clear their fields of stones so they could plant them. The construction of a wall seemed to offer the most appropriate way of using these stones. Of late years, these walls have come to have considerable value in some sections, being in demand both by house builders and road makers. They melt away very quickly when fed into the maw of a stone crusher.

The fact that stone walls have a beauty



A Chimney treated with Field Stones.

of their own has been recognized by many architects and walls of this kind are now being seen around handsome estates. They vary, as they should, with the character of the stones found in different sections of the country, and the method of laying them up depends upon their size and shape. In New England it is customary to use large, fairly round stones and either to use no mortar or to use it in such a way that but little of it shows.

In other sections, particularly in Pennsylvania, many square, flat stones are found and they look best when mortar is used freely to bind them together. Walls of these two types are entirely different in their appearance, a fact which must be remembered when particular architectural results are sought. Oftentimes a man of wealth may desire a stone wall, but finds it necessary to secure the stones elsewhere. That being the case, it is necessary to remember that the effect of the wall depends entirely

upon the size, shape and coloring of the stones and upon the way they are handled.

Stone walls in California are not common, but when seen are found to be made of rather small stones which need plenty of cement to hold them in place. A wall of this kind seems to fit in well with rough bungalow construction, but would be quite out of place on a formal estate.

In building a stone chimney the principle is the same as with a wall. The whole architectural tone is influenced by the character of the stones chosen. An outside chimney of masonry properly constructed often gives no little character to a bungalow or shingled house.

Stepping stones in the garden have much charm and are often used successfully. When natural stones of the proper sort are not available, concrete is often relied upon to make artificial stones, but those created by Nature are much to be preferred, when an informal effect is sought. It is the cus-



A Retaining Wall faced with small Field Stones.



tom to place the stones in regular order equal distances apart, but this is by no means necessary; in fact rather better results are obtained by using stones of different sizes and placing them in some irregular fashion as shown in one of the accompanying illustrations. At the same time it is well to bear in mind that the stones are to serve a utilitarian purpose and that unless they are placed at suitable distances

apart, an attempt to walk on them may prove awkward.

The stones should be as smooth as possible and it is well to sink them into the sod deep enough so that a lawn mower may be run over them without interfering with the blades. When stepping stones are too high considerable extra labor is required to keep the grass around them cut.



Stepping Stones in a Lawn.

# Finishing the Home

WHEN the aboriginal Indian wanted to pitch his tent it mattered little to him, as the work was all done in a few minutes. Therein lies the charm of the so-called savage life, the freedom and the roving life. It meant merely a few saplings and skins, and he wasted little time on the number of skins required.

While the wigwam or tent had dimensions, height, diameter, etc., there was no thought or care as to the proportions or measurements, the one idea being shelter, with a hole in the top for the smoke to drift out. Ventilation was unheard of, heating was the crudest, lighting unnecessary, and permanence a thing to be deplored.

The advent of the white man made strange changes, entirely reversing the theories and traditions of the natives, if they had any. Where logs were plentiful, a substantial cabin resulted. Where there were not enough logs a sod shack did very well until a better building could be erected on or near the same spot.

As soon as the settler had any livestock at all he made an attempt to shelter them also, making them likewise slaves to civilization, but greatly increasing their value to him. Barns, comfortable if crude, protected all the stock, and an attempt was made to wrest a living out of the soil which had theretofore been given over entirely to the wandering tribes and wilder animals.

What has been the result? Just as the settler built permanent homes his civilization has lasted. Just as he has seen fit to improve his farm, his herd, the country has progressed.

True, there have been many handicaps. Crop failures tended to make the settler lose heart and move to pleasanter climes, all sorts of advantages were claimed for the country just outside of reach. But the settler staid on, and as his income increased, became more and more a feature of the neighborhood. His new barns, fences, houses, etc., only kept up with the general improvement of the neighborhood, for what farmer seeing his neighbor enjoying the comforts of new ideas in build-

ing, new materials and improvements on all kinds could keep from joining the procession.

We are to a certain extent a nation of imitators, but the first design or idea must be good and in the nature of an improvement or it will not be very generally followed. But as the country grew, the towns and cities did also. One could not succeed without the others, nor could one get very much ahead of the other. The city had certain advantages due to the concentration of the population and solved innumerable problems in connection with housing, sanitation, etc. The country had a different set of problems, and they have been considered and many of them solved in a manner just as satisfactory.

But just as all the city people do not live in the elevator apartments or the palatial hotels or travel in taxis, so there are many farms and town houses that do not contain all that is latest and best in construction and outfitting. Through all the years there has been a long period of transition in which some felt the change sooner than others, but all in time have become more or less modernized. There has always been an element holding back, depending on others to do the pioneer work and experimenting, and deprecating good work whenever the opportunity arose. Due to this class we still have with us antiquated notions of heating, lighting, ventilating, plumbing, etc., to say nothing of the better kinds of building materials.

The efforts of many men have been written down in book form. The younger generation is thus able to learn in a few years' time practically all that their fathers and forefathers knew on these subjects. They were able, therefore, to start where the others left off and thus add a full lifetime to the progress of the ages. Not all are wise enough to study what had gone before, and so we have the class recently styled the "Grandfather" class, because they are living by the principles which held good many years ago, but which have now been largely superseded. Being unable to appreciate the good as it appears, they class everything new as "book knowledge," "theoret-



ical" and "unpractical." How long will they last? It is hard to tell. The ease with which knowledge can be obtained, the publication of many technical magazines and papers, catalogs of new materials and devices, samples, etc., would seem to leave little chance for ignorance. And yet we must remember a new generation is growing up continuously, and they must have the concentrated wisdom of the ages ready for them as soon as they can read understandingly.

Possibly the science of building has not moved ahead any faster than any other line of industry, but in any event there is a vast difference between the first houses built on the boundless prairie and the modern product of the conscientious contractor and architect.

Among the improvements in building one class may for our purpose be called "built-in building accessories for the home." This includes such items as coal chutes, medicine cabinets, wall safes, dumb waiters, etc.

#### LIGHTING SYSTEM.

Another division consists in apparatus to use to both the house, barn, garage and other buildings on the place. An electric plant, whether operated by a waterwheel in the creek back of the barn, or by a gasoline engine is just as important to the barn and garage as to the house. It can be installed so easily that it is a wonder that every farmer does not run his machines as well as light his buildings by electricity.

There are some who prefer gas to electricity and these have a wide variety of systems to choose from. The contractor should post himself on the various systems, styles and sizes, and so be ready to advise others, pointing out the good points of each and how to avoid the troubles which come upon the unwary. The contractor can do good work by showing the owner how money can be saved by carefully installing the machines, running the piping to drain properly, and calling the owner's attention to the fact that only a first-class contractor is equipped to do the work right. It may sound like blowing his own horn, but do it just the same and make it sound like sense if not like music.

#### THE GARAGE.

Even if you don't have an automobile of your own for pleasure, every contractor

ought to have an auto truck for his business. It makes all the noise you want it to, plenty to let everyone know you are on the map and will help you a whole lot besides carrying your men and material to and from jobs. No one wants to give a contractor his first job, for there is no reputation back of the contractor. No one wants a contractor to build a garage if the contractor is driving a one-horse cart around. What does he know about autos, or turntables, or gasoline tanks, or air pumps, or garage door hangers? Quite so. What does he know? Only what he *reads about*. So the contractor must either read about everything or else have his own auto truck, or at least a motorcycle. He is then ready to talk business in a line he knows something about. The writer knows a talented architect who designed a garage. Not having a car of his own, he made the doors too narrow, so that the chauffeur hit one side or the other almost every time he went in or out; forgot the gasoline tank and it had to be put in later; got the floor too high so it was hard to get in and out; thought a turn-table unnecessary, yet the car must be backed 75 yards, through another narrow gate, over the sidewalk and finally to the street. There were other things he forgot, too, although he figured on a lot of unnecessary things. He didn't quite put in a harness room, but you can rest assured that he will never make the same mistakes again.

Now a contractor, or architect either, owning a car, would not have made those mistakes. Nor would he perhaps had he studied the subject in a different manner. The contractor cannot afford to make mistakes, and so must supplement his own knowledge with that of the manufacturers of specialties designed for just such places. Do they know more than the contractor? Of course they do, but they are willing to pass their knowledge along, and it is the contractor's own fault if he remains in ignorance.

#### THE FARMER.

It isn't far from the house to the barn, but there are a number of different accessories to consider when the distance is traversed. The barn requires just as careful treatment as the house, for it is the *income-producer*, while the house is so much non-producing capital invested. It

is necessary, of course, but it has little or no revenue-producing ability, except as one takes boarders or roomers.

So what can we do for the poor, dumb animals who have no thought as to where their fodder and water are coming from? We can do much for their comfort and contentment. While we have never known a cow to complain, we have often felt sure there were many that wanted to.

Plenty of light from large windows with storm sash in winter and screens in summer is one of the first requirements, and one of the easiest supplied, too. Plenty of fresh air, without a breeze or a draft on the animals, is another excellent investment for a farmer to make. It means carefully planning the inlet and exhaust piping with properly designed ventilators and in this work the contractor can be of great service to the farmer, just as the manufacturer of ventilating systems can and will aid the contractor. Get their ideas, study them and make use of them.

Before you go to see Farmer Green about remodeling his barn figure out what you want to do on it. He may have definite ideas, but don't wait for that. If you are fully posted, you can tell him just how many modern stanchions he can put in in place of the clumsy 2x4 ones he now has; how much room he will save, how much better the light will be, where the feed carrier will run, how long a litter distributor he should have, just where the ventilating ducts must go, why it will pay him to have a first-class ventilator to draw out the vitiated air. You will probably be able to show him how he can save money over his own estimate, if you know your business and the subject thoroughly. Find out what the farmer *has*, what he *wants*, and what you think he *needs*. Study the subject before you approach him, and he will think you are the smartest contractor in the country, to be able to answer his questions off-hand like, without having to come back and change opinions.

#### THE COAL CHUTES.

Just such a little thing as the coal chutes can be of interest to the contractor. He can make a strong talking point of it. Think of being sure no basement windows will be broken or left open, no marked up walls or frames, and all the coal in the bin instead

of all over the yard. The contractor can show where he has put them in, and show buildings where they are not. The comparison is always in his favor.

#### THE DUMB WAITER.

One reason the bungalow is popular is its being all on one floor. Carrying things up and down stairs has discouraged more than a few housewives, and it is so easy for a large part of the trouble to be avoided. Figure out where a dumb waiter can be put in to run from the basement to the second floor perhaps, and you will be surprised to see how many women fall for it. Get a little information on these devices, and put one in your own home for a sample. It will pay you big interest.

#### THE MEDICINE CABINET.

And while you are fixing up your own house, be sure you have a nice medicine cabinet in the bathroom. Medicines don't belong in the kitchen pantry where they can be mistaken for vanilla or some other cookery preparation. The place for them is where, at night, you must turn up the light to see them. Moreover, they should all be together, for in a hurry everyone should know just where to go for the household remedies and "First Aid" supplies. As usually designed, the medicine cabinet not only takes up no space, but its door serves the additional purpose of a mirror. Why, a contractor can almost build the house around such items as the coal chute, dumb waiter and medicine cabinet, and he still has the heating plant, plumbing and lighting left to talk about.

#### THE DOWN TOWN BUILDINGS.

But the homes and the barns, with the garages, etc., are still only a part of the work waiting for the contractor. Is it possible all the stores are up to date in every particular, so that the contractor has nothing to do? Just buy a spool of thread and look at the walls and ceilings. Wouldn't they look better if neatly covered with metal, both walls and ceilings? Make a mental note of what the place needs and get out your catalogs or get some new ones, and make up something for the storekeeper. And look to see if there isn't a chance to put in a rolling ladder or some shelving or fix up the fronts as Mr. Rawson suggests on another page.

If you can get back in the stock room, see



what should be done there. A whole lot of things are just waiting to be suggested. A dumb waiter or freight elevator from the basement to the second floor. An intercommunicating phone from the office to the front of the store, the stock room and to the basement. Don't let the merchant explain that when he wants the stock clerk he has to yell his head off to the annoyance or amusement of the customers. Show him the better way.

Of course, when you have fixed up one store, you know how to fix up the next one, and it is your own fault if it doesn't get into the papers that the enterprising merchant is having his store fixed up by the leading contractor. Editors are only human, and they would lots rather tell what the live ones are doing than expatiate on what the dead ones didn't do.

#### THE FACTORIES.

It may be only a step to the factories of the town, but often it is a step backwards. Any old kind of a building used to be good enough for a factory, and great pains were taken to post "Keep Out" signs everywhere. Now when you strike some towns there is a bus to take you through the modern factories, workshops, etc. There are few secret processes nowadays. It is all a matter of organization and hard work. Every factory ought to be a show place of every town, and the contractor should see

that they are put in shape to receive visitors. Plenty of light, from large windows and skylights—good stairways and fire escapes, sprinkler systems, and plenty of white paint and whitewash help the general appearance, help the workers, help the town, and help the contractor, if he is instrumental in getting these improvements put in.

There is work for the contractor for every month of the year. He may not be laying sidewalks all winter, but he can be working inside. He may find unpleasant work at times, but if it pays that overcomes a lot of objections. He should keep up with every new device and appliance, know all about them so as to use them when the occasion permits. Consider what is good for his town and see where they can be used. Keep posted on the cost of everything, even though you don't want to buy right at that minute. Don't be afraid to ask for catalogs, samples, etc. They are made just for you and the manufacturer is disappointed if you don't get your share.

And where you want more information or assistance, tell your troubles to the manufacturer, and he will promptly help you. And the NATIONAL BUILDER is just as glad to help you as the manufacturer. It's what it is here for, and if you don't get your share of help you have only yourself to blame.

# The Elements of Knots and Hitches

*Edward Van Kaenel*

**W**HEN one's safety depends on the tying of a knot it is important that the knot be tied properly. The strength of the line is important only as the knot holds.

However tight a knot holds, however, it should be possible to easily untie it when necessary. A man handy with lines realizes this and as a consequence uses some of the many forms which have become well known through long use by sailors, riggers and others.

Figures 1, 2, 3 and 4 show the simplest forms of turns, bights, loops and double loops, preparatory to tying the knots shown in the other figures.

Figures 5 and 6 are the Overhand Knot,

and is often used on the ends of ropes when one is in a hurry, also in tying a timber hitch. Its use insures safety.

Figures 7 and 8 show the Square Knot, the commonest knot made, and possibly the one most abused. It is used for tying two ends together and should always be tied as shown. A novice often tries to tie this knot, but makes the "Granny Knot" or "Lubber's Knot," shown in Figures 9 and 10. Get the distinction between these two knots firmly in mind, for the Square Knot is secure and easily untied, while the Granny Knot is insecure, apt to slip, jam or wedge, and difficult to untie after a load is put on it. A good way to learn this knot is with the ends of a short piece of

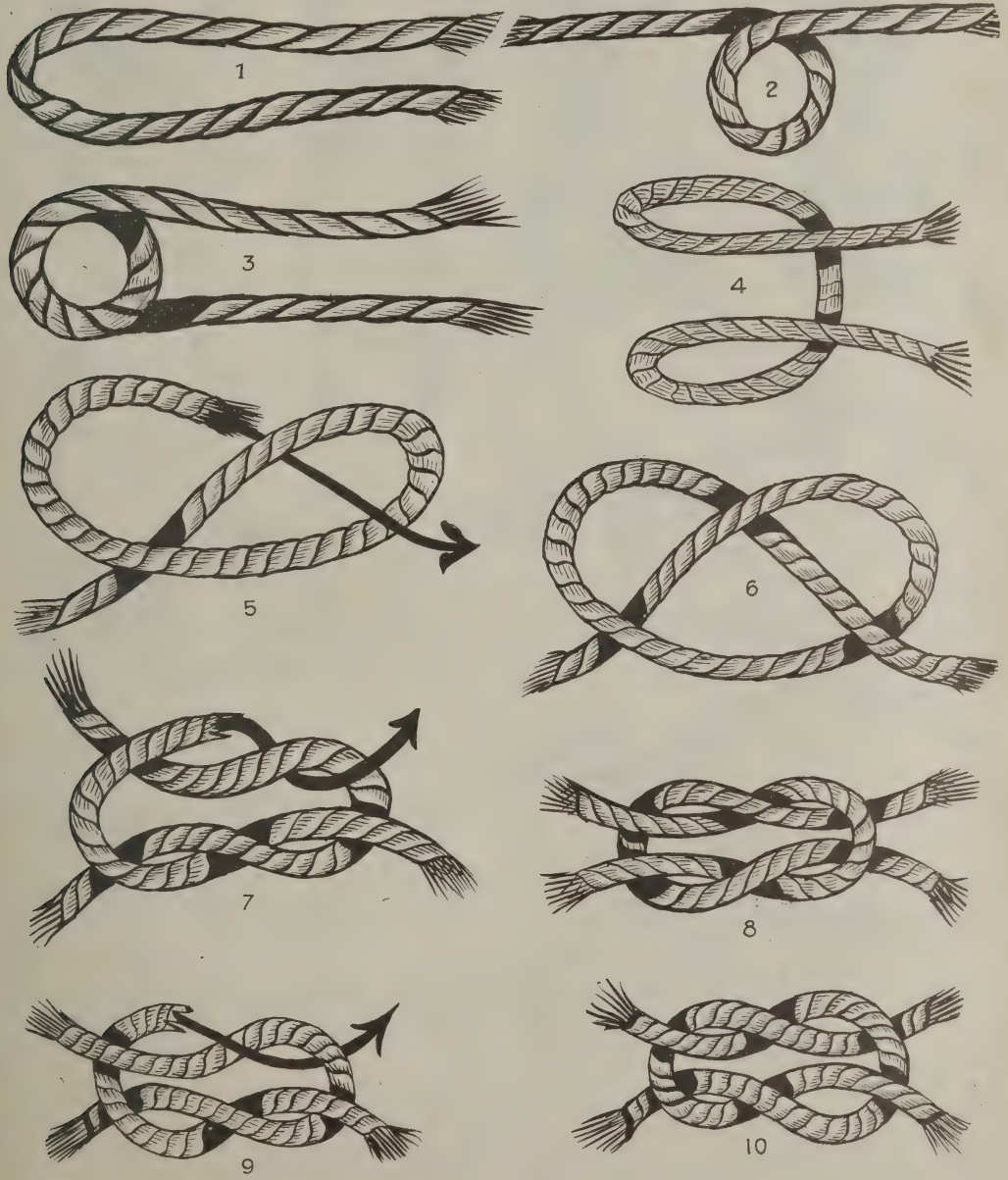
sash cord, and it should be practiced until the Square Knot will almost tie itself in the dark.

Figures 11 and 12 show the Timber Hitch which is used in hoisting boards, logs, poles, etc. Several turns should be made as indicated and the knot pulled tight before lifting the load. An Overhand Knot, Figure 6, on the short end is an additional safeguard with this knot.

Figures 13 and 14 are known as the

Blackwall Knot and depend for their holding on cramping the inner turn against the hook. It is easily released, yet holds firmly. In a reversed position it is sometimes used on the lower block of a tackle to hold the load at any desired point.

Figures 15 and 16 describe a knot used on block and tackles, rings, etc. It is known as the Anchor Bend and is secure even when the load is loose. When properly tied it will not work loose.







Figures 17 and 18 show the Bowline Knot, one of the handiest knots in the list. It holds without slipping, does not jam when used and unties easily. When used for a loop it does not slip up, but it must be carefully tied. Practice on this knot is well worth the effort.

Figures 19 and 20 are of a Slip Knot. It

is readily formed from a loop as shown and is handy for such loads as bags of cement. It can be tied in the middle of a line.

Figures 21 and 22 are Clove Hitches, and are used for making a guy line fast. It is another good knot to practice on.

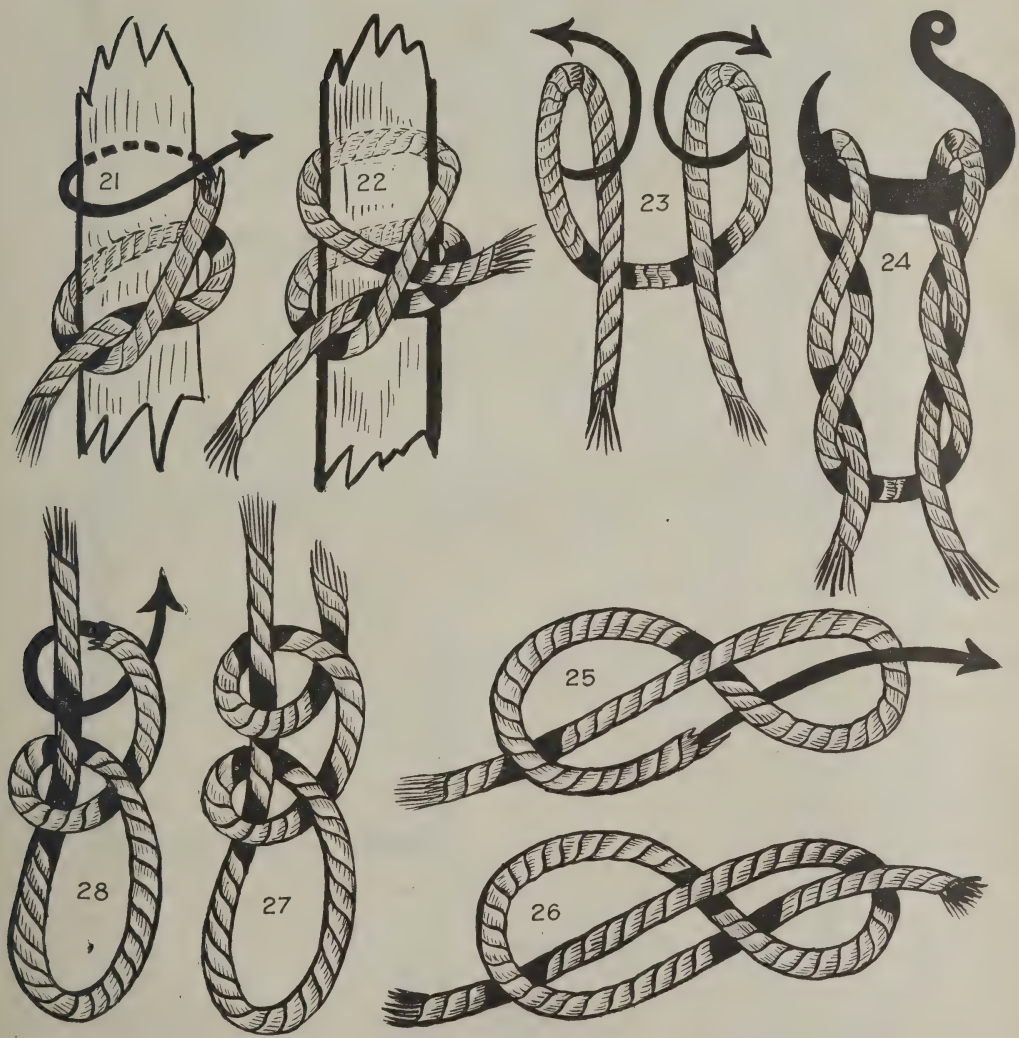
Figures 22 and 24 are the Cat's Paw,

used for guying and for preventing the twisting of the block and tackle system. A load may be safely suspended on either end of the line.

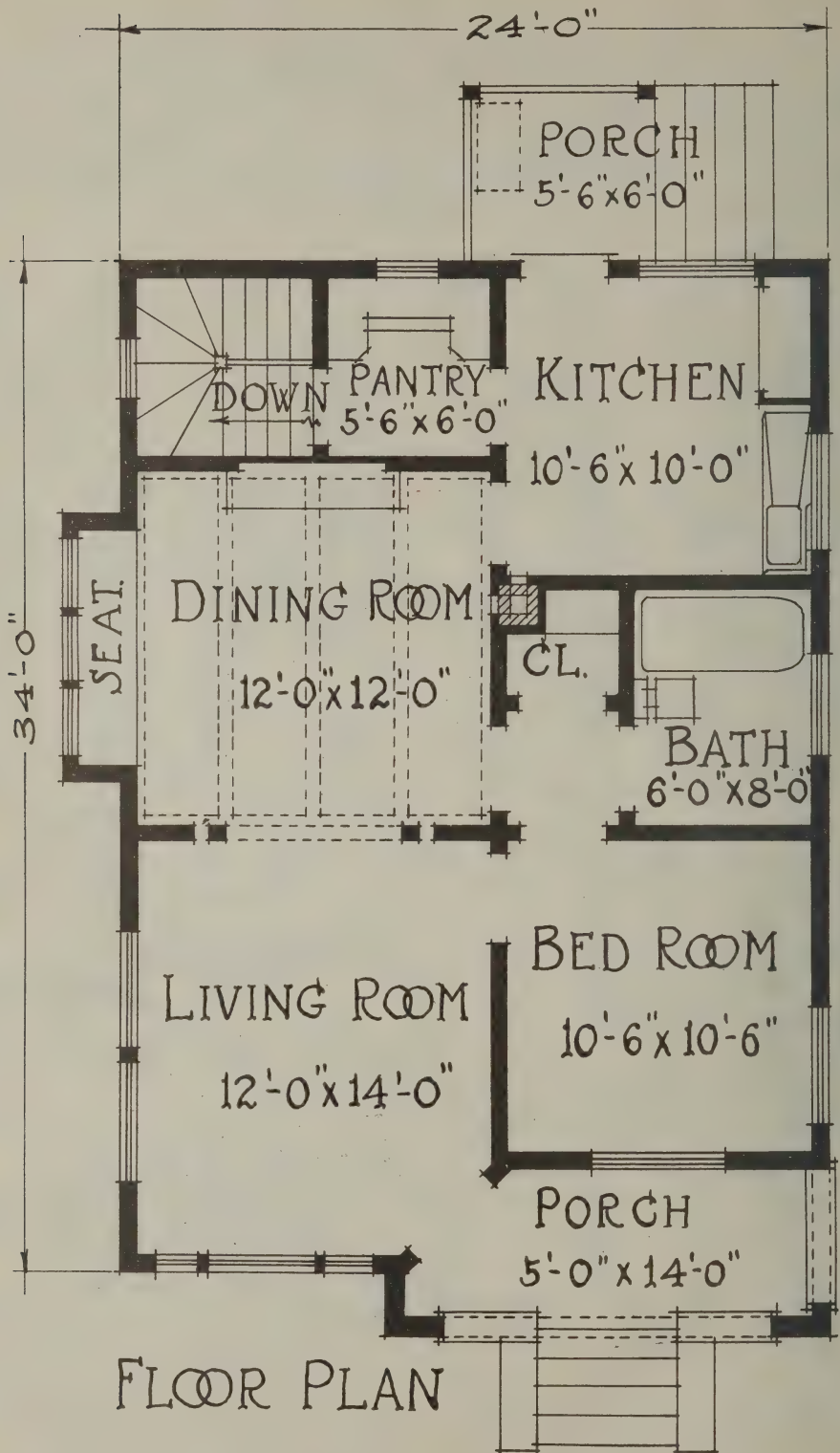
Figures 25 and 26 are more an ornamental than useful knot, but it can be used on a single rope ladder by making the knots a foot apart. It is useful also as a stop knot

for main lines, as it will not go through a block.

Figures 27 and 28 show a quick method of tying up bundles of objects such as lumber, bricks, stone, slate, etc. It is probably more secure than the Timber Hitch (Figures 11 and 12) and is used for about the same purpose.









Simple Lines with little Ornamentation on Bungalow.

## A Charming Home

*Jud Yoho, Architect*

**A**NY building for a narrow lot requires careful treatment and planning.

The City building is probably easier to design than the Bungalow for the former considers only the lot lines, while the Bungalow must reckon with the adjoining lots and buildings, and even with the general appearance the street and neighborhood, if the fullest satisfaction is to be obtained.

In this particular case the Architect has considered his problem carefully, and obtained a maximum of space for the ground covered. The amount spent on exterior decoration is surprisingly small, consisting only of a few brackets and a curved beam over the porch steps. Yet there is no appearance of forced economy or of getting all the house possible for the money. The casement windows and flower boxes take it out of the "plain" class and put it in the "charming" division, while the roof dormers provide ample cross ventilation where it is most needed. Everyone who has gone to the attic for something on a hot summer's day knows what ventilation is required to keep the lower rooms cool.

The exterior is resawed siding stained a dark brown, while the trim is planed fin-

ish painted white. Brown seems to be the accepted color for bungalows.

But not only the exterior but the interior interests us. From front porch to rear porch the space is well utilized. The rooms are large enough for the size family which would probably use them, while the arrangement is good. The regular shape of the Dining Room allows a pleasing treatment in the way of a beamed ceiling and a built-in buffet, as well as the colonnade between the Dining Room and Living Room.

Too many bungalows are designed without much regard for actually living in them. Of course, in a warm climate a fireplace will do for heat, but even there in the warmest part of the United States, a good basement and furnace would make the house mighty cheerful at times. A basement is provided for here, and the man of the house can have a little workshop, a dark-room for his photography, or any of the conveniences which are sort of out of place on the first floor and a long ways off when in the attic. Did you ever try to work in the attic in the winter? It is usually a cold job, but the basement is always comfortable. A nice basement is fine for drying clothes, or if one has a chicken farm, for operating the incubator.

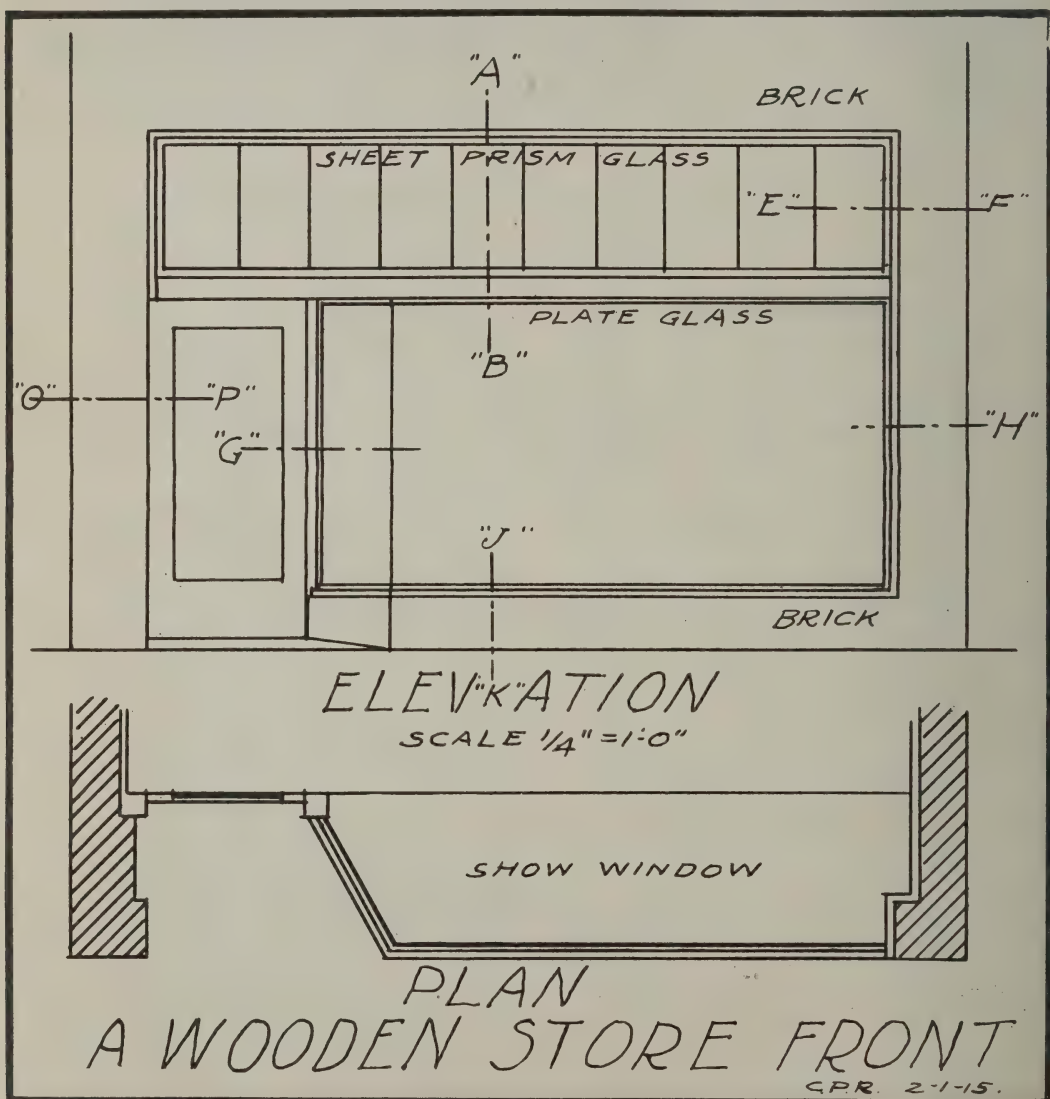


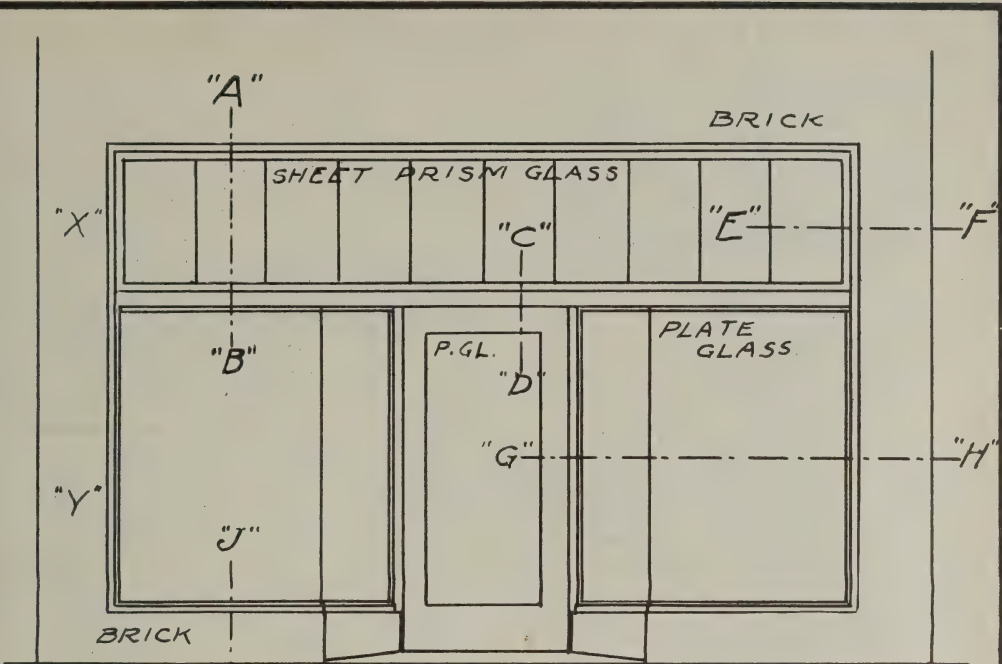
# A Wooden Store Front

*Chas. P. Rawson, Architect*

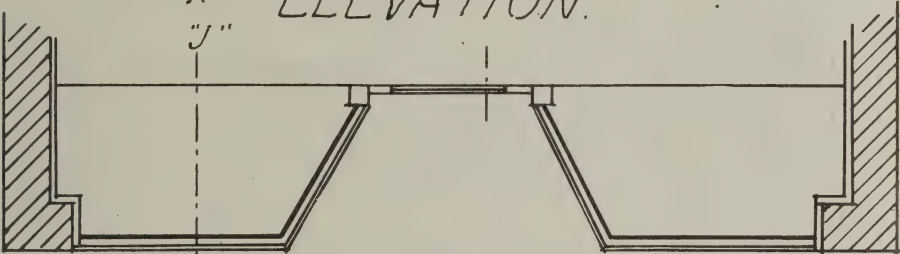
**H**EREWITH are designs of simple wooden store fronts made to fit the same size brick opening. These designs may be used either on new or remodelled work. The main frame is 2"x8" stuff with a 6"x8" transom bar. There are no basement lights as is usual in most new fronts, but the detail shows how these may be arranged if desired. The elevations show this lower space bricked up. The transom is one

fixed sash glazed in small panes of sheet prism glass. The plate glass panes forming the show windows should be mitred at the corners and the edges fastened together with clamps made for the purpose. All the details shown on the third and fourth drawings except that marked at "O", "P" apply to both store fronts as they are similar in construction. "O", "P" applies to the side entrance front only.

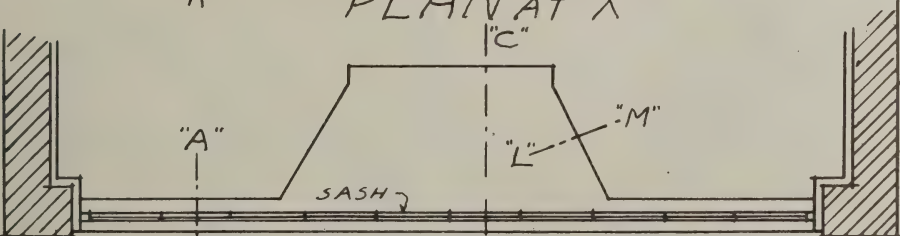




"K" ELEVATION.  
"J"



"K" PLAN AT "X"  
"C"

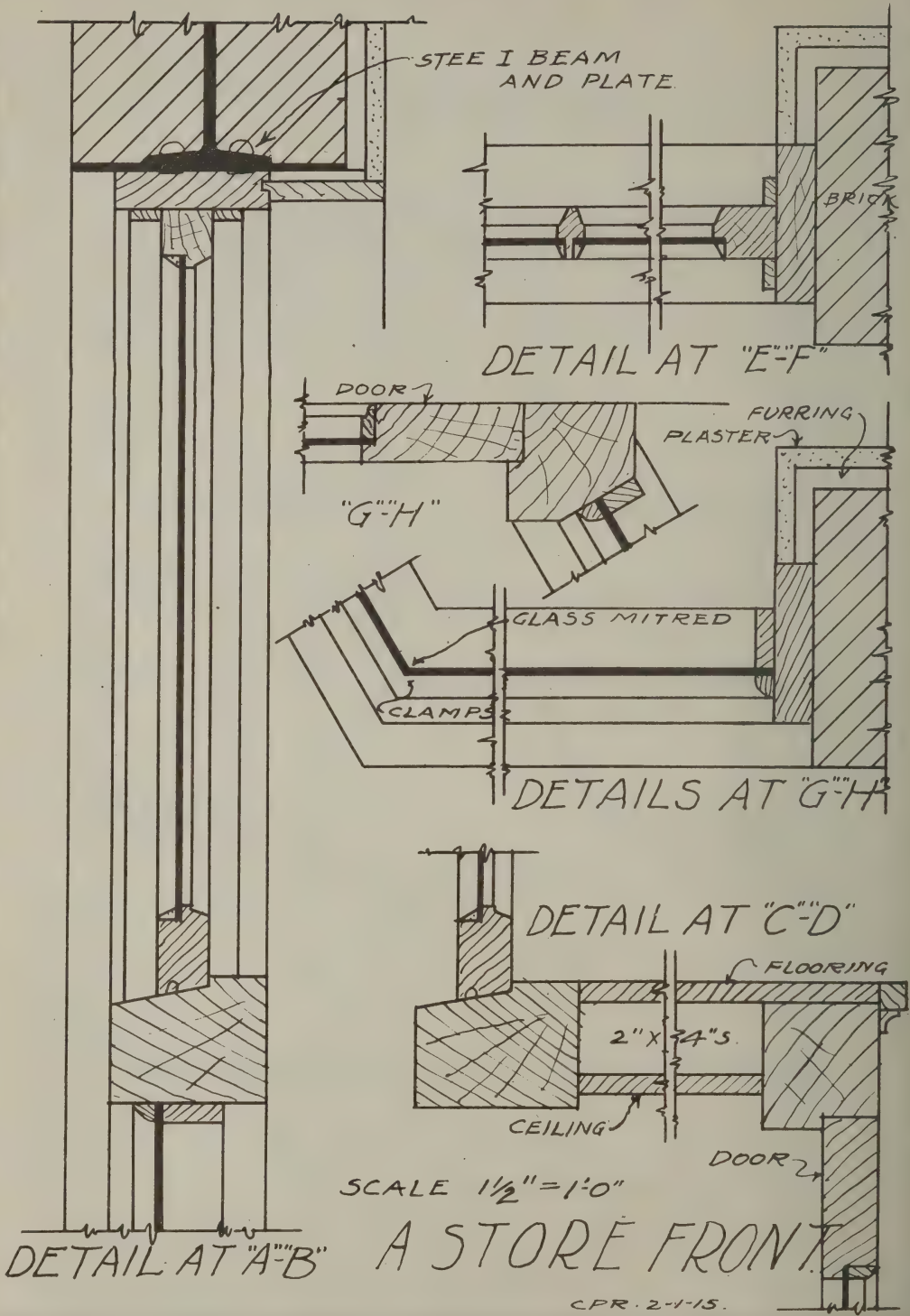


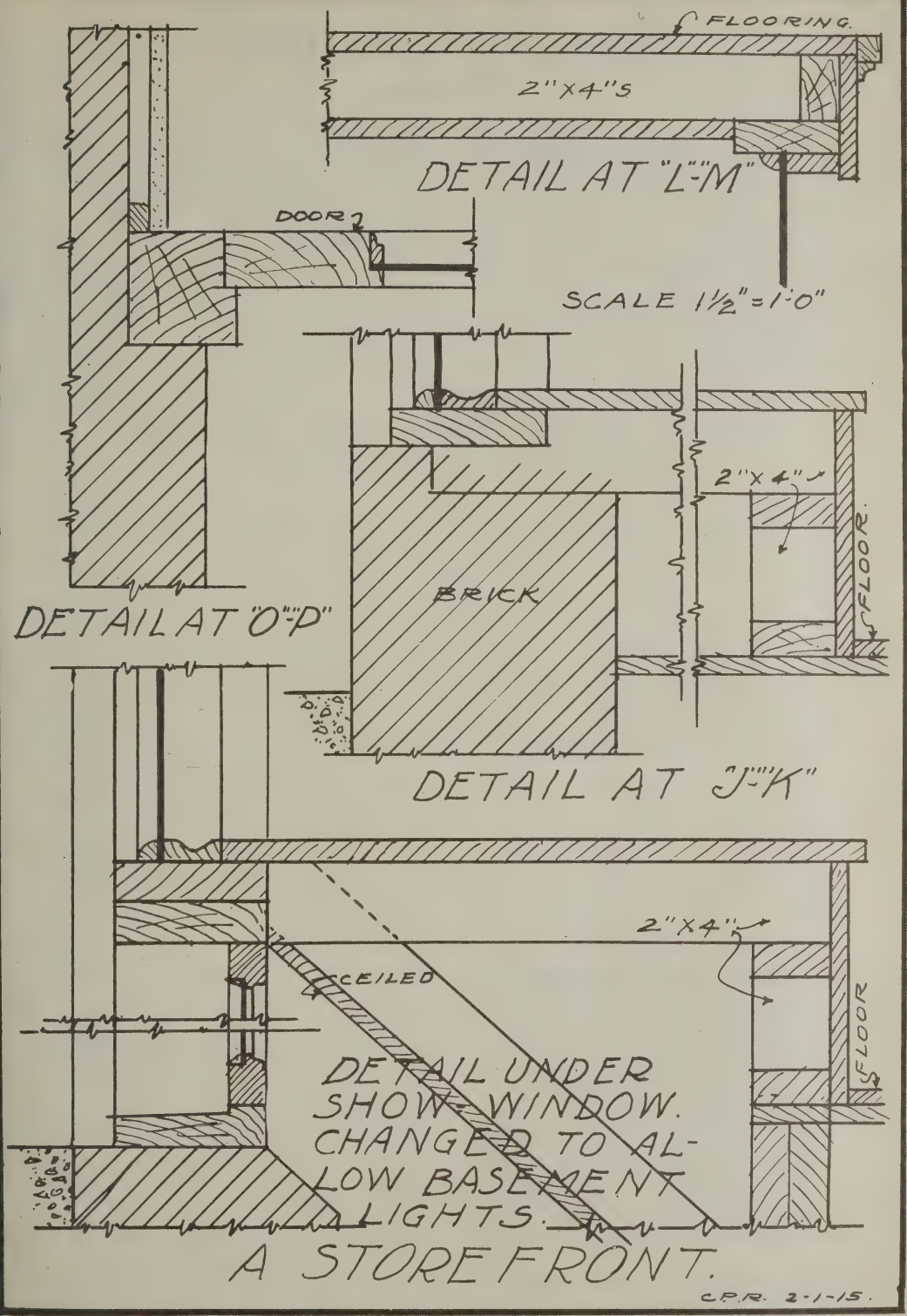
"B" PLAN AT "Y"  
SCALE 1/4"=1'-0"

A WOODEN STORE FRONT.

C.R. 2-1-15.









# How to Estimate

I. P. Hicks

ESTIMATING is of more than ordinary interest to the carpenter and contractor. The financial success of a carpenter and contractor depends largely upon his knowledge and accuracy in estimating. His success depends on these two things, accuracy in estimating and good management in the execution of the work. Good management and hard hustling may to some extent overcome slight mistakes in estimating but no amount of hard labor or the best of management will make up

is much need of a list of all the items that go to make up the estimate, arranged in a systematic order, to remind the estimator of everything likely to be required.

We have accordingly prepared the following list of items for this purpose. We have also prepared a Blank to be used in connection with the list, in the following manner: On the first line write in what the estimate is of, whether of lumber, mill work, hardware or as the case may require. Then fill in the Job number, the name of

## HICKS' HANDY ESTIMATE BLANK

FOR CARPENTERS AND CONTRACTORS

Estimate of \_\_\_\_\_ Job No. \_\_\_\_\_

For \_\_\_\_\_

By \_\_\_\_\_ Contractor

Index No	Feet	Pieces	Description of Materials	Rate	Cost				

for the losses which bad estimating bring about. Therefore, the first and all important thing for success in carpentry is the making of accurate and complete estimates; then with careful management and good work you will be sure to achieve success.

The first essential point in estimating is that there must be some system about it. No kind of work progresses to any great extent or comes anywhere near perfection without some system to it, and the better the system the more complete will be the work.

In estimating for a building there are hundreds of items to figure on, hence there

the party you are making the estimate for and your own name as carpenter or contractor.

In the Blank the first column is the Index number, which is a very complete and handy arrangement. This Index number always indicates just what you figured for every part of the work. For example, suppose you figure 1,200 feet of number 2 sheathing for a rough floor. In the Index column opposite this item you will find number 32, so in the Blank opposite this item in the Index Column you write number 32, and you can tell forever afterwards that the 1,200 feet of number 2 sheathing

was figured for the rough floor. There may be sheathing for the outside walls and roof but these have different numbers so you can always tell which is which. The same is true of the studding, joists and all material, the Index number that corresponds with the list will always indicate just what part of the building you figured the material for.

just what it was figured for. You can lay away your bill for an indefinite time and when you compare the bill with the list you can tell instantly just what you figured every item for.

These Blanks can be used for any part of the estimate; they are equally applicable to all parts by the same method. There are

THE COMPLETE ESTIMATE

Excavating and masonry.....		
Lumber bill .....		
Mill work .....		
Mantels and sideboards.....		
Carpenter labor .....		
Nails and hardware.....		
Tin and sheet metal work.....		
Structural iron .....		
Plastering .....		
Gasfitting .....		
Plumbing .....		
Electric wiring .....		
Painting .....		
Heating plant .....		
Incidentals, 5% .....		
Total estimate.....		

To illustrate farther suppose you have several different lengths of first floor joists, you put number 6 in the Index Column opposite each different length or size and you will know that all the different lengths and sizes bearing the Index number 6 were figured for the first floor joists. In the same manner everything can be indicated in the Index Column so that you can always tell

no lines to skip because they do not fit your job, you simply skip the items in the list that you do not have to figure, but when you make out your bills on the Blanks the items can appear continuous, no skipping lines, the number in the Index Column tells you what you have figured, and the list reminds you of everything you ought to figure.

EXCAVATING AND MASONRY.

1 Excavating	5 Stone work	10 Terra Cotta	15 Outside plastering
2 Footings	6 Cut stone	11 Chimneys	16 Cisterns
3 Concrete	7 Cement stone	12 Fire Places	17 Cess pools
4 Cement work	8 Building tile	13 Flue lining	18 Tile floors
	9 Brick work	14 Plastering	



## LUMBER ITEMS.

1 Girders	14 Porch rafters	26 Bridging	39 Porch floor
2 Sills	15 Outside stud-	27 Furring	40 Porch ceiling
3 Posts	ding	28 Purlin timbers	41 Room ceiling
4 Tie Girts	16 Gable studding	29 Truss timbers	42 Cornice ceiling
5 Basement joists	17 Studding for	30 Lath	43 Wainscoting
6 First floor joists	dormers	31 Outside sheath-	44 Building paper
7 Second floor	18 Partition Stud-	ing	45 Deadening felt
joists	ding	32 Rough floor	46 Finish $\frac{1}{2}$ " and
8 Third floor	19 Plates	33 Roof sheathing	$\frac{7}{8}$ "
joists	20 Common rafters	34 Shingles	47 Finish 1 $\frac{1}{8}$ "
9 Attic joists	21 Hip rafters	35 Dimension	and 1 $\frac{3}{8}$ "
10 Ceiling joists	22 Valley rafters	shingles	48 Finish 1 $\frac{3}{4}$ "
11 Porch joists	23 Collar beams	36 Beveled siding	49 Main finish floors
12 Porch beams	24 Ribbon boards	37 Drop siding	50 Attic floors
13 Porch ceilings	25 Braces	38 Battens	

## MILL WORK, OUTSIDE FINISH.

1 Porch columns	9 Gable brackets	18 Cove molding	25 Window frames
2 Porch railing	10 Gable ornaments	19 Quarter round	26 Gable frames
3 Porch frieze	11 Cresting	20 Cellar window	27 Tower frames
rail	12 Finials	frames	28 Transom sash
4 Porch newels	13 Crown molding	21 Cellar door	29 Windows
5 Porch balusters	14 Bed molding	frames	30 Sash windows
6 Porch spindles	15 Band moldings	22 Cellar sash	31 Blinds
7 Porch lattice	16 Panel molding	23 Cellar doors	32 Skylights
8 Cornice brackets	17 Watertable	24 Door frames	

## MILL WORK, INTERIOR FINISH.

33 Front doors	44 Casings	55 Base	65 Cellar stairs
34 Side doors	45 Head casing	56 Base mold	66 Main stairs
35 Rear doors	46 Cap mold	57 Floor mold	67 Rear stairs
36 Sliding doors	47 Fillet	58 Wainscoting	68 Attic stairs
37 Folding doors	48 Embossed mold	cap	69 China closet
38 Main doors	49 Window stool	59 Chair rail	70 Grill work
39 Closet doors	50 Apron	60 Plate rail	71 Storm sash
40 Cupboards	51 Window stop	61 Band mold	72 Screens
41 Door jambs	52 Door stop	62 Panel mold	73 Mantels
42 Plinth blocks	53 Plinth blocks	63 Picture mold	74 Corner beads
43 Cased openings	54 Corner blocks	64 Thresholds	

## CARPENTER WORK, OUTSIDE.

1 Framing floors	7 Shingling out-	15 Corner casing	24 Side porch
2 Rough floors	side walls	16 Belt course	25 Rear porch
3 Framing ceil-	8 Framing roofs	casing	26 Outside stairs
ings	9 Sheathing roofs	17 Dormer casings	27 Inside partitions
4 Laying ceilings	10 Shingling roofs	18 Main cornice	28 Furring
5 Framing outside	11 Porch roofs	19 Gable cornice	29 Bridging
walls	12 Metal roofs	20 Dormer cornice	30 Grounds
6 Sheathing out-	13 Composition	21 Gutters	31 Setting frames
side walls	roofs	22 Gable finish	32 Cutting
	14 Outside base	23 Front porch	

## CARPENTER WORK, INSIDE FINISHING.

33	Cellar windows	42	Double acting doors	50	Casings	60	Grilles
34	Cellar doors			51	Inside base	61	Closet shelves
35	Coal bin	43	Common doors	52	Beam ceiling	62	Hook strips
36	Vegetable cellar	44	Cupboard doors	53	Picture mold	63	Medicine cabinet
37	Front doors	45	Drawers and cases	54	Chair rail	64	Mantels
38	Side doors			55	Plate rail	65	Front stairs
39	Grade entrance doors	46	Main windows	56	Wainscoting	66	Rear stairs
40	Sliding doors	47	Sash windows	57	Pantry	67	Attic stairs
41	Folding doors	48	Gable windows	58	Cupboard	68	Cellar stairs
		49	Attic windows	59	China closet		

## HARDWARE ITEMS.

1	Nails, various sizes	7	Front door locks	11	Door bolts	19	Sash weights
2	Brads	8	Outside door locks	12	Door hangers	20	Sash balances
3	Screws			13	Spring hinges	21	Shelf brackets
4	Door butts	9	Inside door locks	14	Transom lifts	22	Wardrobe hooks
5	Cupboard butts			15	Sash pulleys	23	Door stops
6	Cupboard catches	10	Sliding door locks	16	Sash cord	24	Door checks
				17	Sash locks	25	Blind hinges
				18	Sash lifts	26	Sand paper

## TIN AND SHEET METAL.

1	Roofing tin	5	Down spouts	9	Steel ceiling	12	Hip finish
2	Tin window caps	6	Valley tin	10	Steel wainscot- ing	13	Cresting
3	Steel roofing	7	Flashing	11	Ridge roll	14	Finials
4	Gutters	8	Hip shingles				

## STRUCTURAL IRON.

1	Steel beams	7	Wall ties	13	Truss plates	18	Iron railing
2	Channels	8	Wall plugs	14	Straps	19	Area grating
3	Lintels	9	Joist hangers	15	Coal chutes	20	Window guards
4	Columns	10	Post caps	16	Bolts and washers	21	Metal sash bars
5	Plates	11	Post bases			22	Store entrance plates
6	Anchors	12	Truss rods	17	Steel shutters		

(To be continued.)







A Chicago Residence. Treat and Alschuler, Architects.

# Estimate of a Providence Home

I. P. Hicks

## NATIONAL BUILDER DESIGN NO. 393.

Geo. L. Warfield, Architect.

For Floor Plans, Sections, Elevations and Full Working Drawings, see Double Supplement of this month. Estimated Cost \$5,376.73.\*

EXCAVATING.

244 yds. excavating, 35c..... \$80.40

MASONRY.

830 cu. ft. concrete wall, 25c.....\$207.50  
8,100 brick laid in walls, \$13..... 105.30  
48 lineal ft. 12x12 chimney, \$1.50 72.00  
1,050 ft. cement floor, 10c..... 105.00  
1 granite step..... 10.00  
4 catch basins, \$12..... 48.00  
1 coal chute..... 15.00

Total masonry.....\$562.80

LUMBER BILL.

	Feet.
1 6/ 8x18 ft. girder.....	72
1 6/ 8x16 ft. girder.....	64
48 2/ 4x16 ft. basement partitions..	528
30 2/10x14 ft. first floor joists.....	690
14 2/10x20 ft. first floor joists.....	462
8 2/10x18 ft. first floor joists.....	240
8 2/10x16 ft. first floor joists.....	216
16 2/10x16 ft. second floor joists....	432
14 2/10x14 ft. second floor joists....	322
15 2/10x20 ft. second floor joists....	495
8 2/10x16 ft. second floor joists....	216
8 2/10x18 ft. second floor joists....	240
32 2/ 8x16 ft. attic floor joists.....	672
30 2/ 8x14 ft. attic floor joists.....	570
6 2/ 8x12 ft. attic floor joists.....	96
28 2/ 6x18 ft. attic ceiling joists....	504
16 2/ 6x12 ft. attic ceiling joists....	168
46 2/ 8x10 ft. for porch floor and ceiling .....	621
48 2/ 8x18 ft. for porch floor and ceiling .....	1,052
36 2/ 6x12 ft. for porch roof joists.	432
148 2/ 4x22 ft. outside studs.....	2,220
48 2/ 4x16 ft. for dormers.....	528
6 2/ 6x18 ft. for partitions.....	108
78 2/ 4x18 ft. first story partitions.	930
70 2/ 4x18 ft. second story partitions .....	840

40 2/ 4x16 ft. attic story partitions.	440
56 2/ 4x16 ft. plates.....	616
38 2/ 4x12 ft. plates.....	304
4 2/ 6x28 ft. hip rafters.....	112
12 2/ 6x20 ft. common rafters.....	240
50 2/ 6x18 ft. common rafters.....	900
60 2/ 4x12 ft. for lookout rafters..	480
10 1/ 4x16 ft. ribbon boards.....	53
60 1/ 6x12 ft. braces and backing..	360
36 1/ 4x12 ft. No. 1 common for bridging .....	144

Total ft. dimension lumber.....16,367

16,367 ft. framing lumber, \$24..\$	392.80
2,550 ft. No. 2 8-inch lap rough floors, \$24.....	61.20
3,600 ft. No. 2 10-inch shtg., outside walls, \$24.....	86.40
700 ft. No. 2 8-inch lap coal bins,, \$24.....	16.80
2,200 ft. No. 2 6-inch shtg., roof, \$24.....	52.80
770 ft. No. 2 8-inch lap, porch roof, \$24 .....	18.48
2,950 ft. 7/8x2 1/4 face clear flg., \$30 .....	88.50
950 ft. 7/8x3 1/4 face star flg., attic, \$24.....	22.80
22 M. clear shingles, roof, \$3.50 .....	77.00
14 M clear shingles, outside wall, \$3.50.....	49.00
2,200 ft. 1/2x4 inch siding, \$26..	57.20
800 ft. 1x4x10 ft. flg., porch \$40 .....	32.00
800 ft. 5/8x4x10 ft. ceiling, porch, \$25.....	20.00
1,075 ft. 5/8x4x12 ft. 16 ft. ceiling cornice, \$26.....	27.95
10 rolls tarred felt building paper, \$1.00.....	10.00
5 rolls R. R. paper, 50c.....	2.50
41 1x4x16 ft. finish, \$40.....	8.72
23 1x12x16 ft. finish.....	14.72

\*Materials are figured at Omaha prices. Carpenter labor figured at 50 cents per hour.



30 1x8 16 ft. finish.....	12.80	6 window frames, 32x20, top sash div., 2 lts., \$2.....	12.00
16 1x6x16 ft. finish, \$40.....	5.12	1 window frame, 24x20, top sash div., 2 lts.....	1.75
5 1½x12x10 ft. finish, \$40..	2.50	1 triple frame center window, 28x24, top sash divided, 2 lts., half circle; 1 transom divided 4 lts., side windows, 14x24, 2 lts.....	10.00
3 1½x12x12 ft. finish, \$45..	2.02	15 windows, 32x28, top sash div., 2 lts., \$2.50.....	37.50
12 1x12x12 ft. finish, \$40....	5.76	2 windows, 36x28, top sash div., lts., \$2.80.....	5.60
2 1½x12x12 ft. finish, \$45..	1.35	6 windows, 32x20, top sash div., 2 lts., \$2.....	12.00
Total lumber bill.....	\$1,068.44	1 window, 24x20, top sash div., 2 lts.....	1.65
MILL WORK.		1 window, 28x24, top sash div., 2 lts.....	1.75
8 8x8x8 ft. turned porch col., \$2.00 .....	\$ 16.00	1 half circle transom div., 4 lts.	2.00
4 pieces circular porch rail bottom, 10 ft. each.....	4.00	2 windows, 14x24, 2 lts., \$1.10.	2.20
4 pieces circular porch rail, top, 10 ft. each.....	4.00	4 windows, 22x28, 2 lts., \$1.25	5.00
2 pieces curved rail, 4 ft. each, top, \$1.....	2.00	3 pair blinds, 32x20, 2 lts., \$2.40	7.20
7 pieces top rail, 16 ft. each....	5.60	3 pair blinds, 32x28, 2 lts., \$2.60	7.80
7 pieces bottom rail, 16 ft. each.	5.60	14 set door jambs, 2-8x6-8, 60c..	8.40
420 1¾x1¾x22 inches turned balusters, 8c.....	33.60	1 set door jambs, 2-2x6-0.....	.60
1,250 ft. 1¾-inch lattice, 50c.....	6.25	1 set door jambs, 2-2x6-8.....	.60
2 large cornice brackets, \$2....	4.00	2 set door jambs, 2-6x6-8, 60c..	1.20
2 hood brackets, \$1.50.....	3.50	4 set door jambs, 2-6x6-6, 60c..	2.40
9 cellar window frames, 10x18, 3 lt. \$1.25.....	11.25	1 set door jambs, 1-4x6-6.....	.60
1 cellar window frame, 10x18, 2 lt.....	1.25	1 set door jambs, 2-0x6-8.....	.60
9 cellar sash, 10x18, 3lt., 80c...	7.20	1 front door, 3-6x7-0x1¾.....	10.00
1 cellar sash, 10x18, 2lt.....	.60	1 outside door, 2-0x6-8x1¾....	6.00
1 grade cellar door frame 2-10x6-4 .....	2.25	1 outside door, 2-6x6-6x1¾....	5.00
3 inside cellar door frames, 2-8x6-8, \$2.....	6.00	14 doors, 2-8x6-8x1¾, \$2.75....	38.50
1 toilet door.....	2.50	1 door, 2-2x6-0x1¾.....	2.50
1 cellar door, 2-10x6-4x1¾....	4.50	1 door, 2-2x6-8x1¾.....	2.50
2 cellar doors, 2-8x6-8x1¾, \$2.50 .....	5.00	2 doors, 2-6x6-8x1¾, \$2.60....	5.20
380 ft. ¾-inch crown mold, 2c...	7.60	4 doors, 2-6x6-6x1¾, \$2.60....	10.40
400 ft. 1½-inch bed mold, 1c.....	4.00	1 door, 1-4x6-6x1¾.....	2.00
340 ft. 1½-inch round mold, 1c..	3.40	1 door, 2-0x6-8x1¾.....	2.40
240 ft. ¾-inch cove mold, ½c...	1.20	360 ft. 12 ft. casings for windows, 3c.....	10.80
78 cornice brackets, 25c.....	19.50	648 ft. 12 ft. casings for doors, 3c	19.44
1 front door frame, 3-6x7-0, rab. 1¾-inch .....	2.50	108 Plinth blocks, 5c.....	5.40
1 door frame, 2-0x6-8, rab. 1¾-inch .....	2.00	350 ft. head casings, 12 ft., 3c...	10.50
1 door frame, 2-6x6-6, rab. 1¾-inch .....	2.25	360 ft. cap mould, 2c.....	7.20
15 window frames, 32x28, top sash div., 2 lts., \$2.....	30.00	350 ft. fillet, ½c.....	1.75
2 window frames, 36x28, top sash div., 2 lts., \$2.....	4.00	406 ft. window stop, 14 ft., ¾c..	3.04
4 window frames, 22x28, 2 lts., \$2.00 .....	8.00	486 ft. door stop, 14 ft., 1c.....	4.86
		120 ft. window stool, 2½c.....	3.00
		120 ft. apron, 2½c .....	3.00
		790 ft. base, 4c .....	31.60
		790 ft. floor mold, ½c.....	3.95
		550 ft. picture mold, 1½c.....	8.25
		Front stairs .....	45.00

Stairs from kitchen.....	18.00
Attic stairs.....	23.00
Stairs, kitchen to landing, going to cellar.....	6.00
2 flour bins .....	4.50
1 pantry case cupboard.....	20.00
1 china closet .....	15.00

Total mill work.....\$658.69

## CARPENTER LABOR.

16,367 ft. framing lumber, \$10....	\$163.67
9,820 ft. sheathing, \$10.....	98.20
2,950 ft. flooring, \$20.....	59.00
22 squares smoothing floors, \$1.50 .....	33.00
950 ft. attic floor, \$15.....	14.25
22 M. shingles on roof, \$2.....	44.00
14 M. shingles on side walls, \$3	42.00
2,200 ft. siding, \$15.....	33.00
Add for mitered corners....	10.00
2,675 ft. force floor, ceiling and cornice plancier, \$15.....	40.12
100 lineal ft. outside base, 4c....	4.00
100 lineal ft. belt course, 6c.....	6.00
156 lineal ft. main cornice, fascia and mouldings, 10c.....	15.60
108 lineal ft. dormer cornice, 10c	10.80

88 lineal ft. porch cornice, 20c	17.60
Add for circular corner....	12.00
Setting frames.....	14.00
Cellar stairs from landing to cellar bottom.....	4.00
Extra work around closets..	10.00
Finishing 45 per cent cost of mill work.....	296.41

Total .....\$927.65

## THE COMPLETE ESTIMATE.

Excavating .....	\$ 80.40
Masonry .....	562.80
Lumber .....	1,068.44
Mill work.....	658.69
Carpenter, labor.....	927.65
Hardware and nails.....	87.00
Tin work, including porch roof...	128.00
Two mantels .....	95.00
Plumbing .....	350.00
Electric Wiring .....	75.00
Plastering, 1,385 yards, 27c.....	373.95
Painting .....	320.00
Heating plant.....	395.00
Incidentals, 5 per cent.....	254.80

Total estimate.....\$5,376.73

## How To Use This Estimate

This estimate is figured at Omaha prices, with carpenter labor at 50 cents an hour. To use this estimate for other localities the reader will note that the price of each grade of lumber, as well as all other materials, is given in the regular trade units, that is per thousand feet for lumber, per thousand for shingles, per cubic yard for excavating, etc.

It is a simple matter to substitute the prices current in your vicinity for the

prices given in this estimate and to extend the quantities and so determine the exact cost for your neighborhood.

For instance, framing lumber may be \$30 per thousand in your town while it is figured in this estimate at \$25. Simply extend the number of feet at \$30; labor may be more or less. The owner may want to contract for the furnace or plumbing separately. The detailed estimate makes these changes possible.





# Build Now

WHY THE CONTRACTOR SHOULD BE BUSY LOOKING FOR JOBS NOW WHEN PRICES ARE FAVORABLE, MEN ARE PLENTIFUL AND THE WEATHER GOOD

**B**UILDING a home is in some ways a psychological matter. The owner must feel the need of the building, the contractor must get his estimate within the required limits, and the architect must provide the needed accommodations. All must work together, harmoniously if possible, if not, all must be harmonious at the end.

Few suggestions act quicker on the owner than the idea that materials have been higher in price, but are now at the lowest point, with the appearance of soon increasing in price. At the present time this condition exists and it is doubtful if prices will ever again be as low as they are, or that they will remain stationary for any length of time. The slogan "Build Now" is of real interest to the contractor as it is in a time when there is no logical reason for financial depression in this country. In fact, these United States should be on a high wave of prosperity, with good prices for all materials, and work at good wages for everyone willing to work. The causes of the disturbed condition are entirely without the country, and there is little reason why the United States should not soon return to a condition of perfect confidence in the future.

With this idea in view, the contractor can readily see why he should be actively searching for possible builders, and starting the jobs which will keep him busy through the summer months. Just now prices are low, men are plenty, and the weather is fair for the greater part of the time. The far-sighted contractor has no doubt been active for several months, getting the plans ready, satisfying the owner of his ability and integrity, and placing orders for the required materials.

But he hasn't exhausted the field. Far from it. Nor has he secured all the good contracts or the big ones either. There are lots of owners just waiting for the contractor to show them the advantages of starting a long-deferred project, and the

chances are the first man on the job gets the contract.

Cold weather should not discourage the contractor. Let him call on the procrastinating owner and show him how next winter he can be in a home made comfortable through careful construction with modern materials, and heated, with less coal than now, by a modern furnace or steam plant. Cold weather is just the time to show off the houses you built last summer and a few calls on the owners you built for will often give you the names of callers who have admired the home and expressed a wish for a similar one.

A contractor should feel that he has a right to show off his houses. Ten to one the owner is proud of it and thinks he is responsible for all its good features. Never mind that, the fact that you built it and can duplicate it if necessary will go a long ways in your favor.

And this brings us to a most important point, that of duplication. No one wants a house exactly like someone else and no one wants anyone else to know just what their house cost. The contractor should have no difficulty in suggesting slight changes, just enough to change the appearance and price without requiring structural changes. The changes should, however, be carefully worked out before proceeding with the work, otherwise there are apt to be embarrassing moments when things don't come out right.

That the contractor may have a variety of plans to choose from we are giving this month two plans on our supplement sheet. One, the classy little Florida bungalow, you have already seen. Now we are also giving you a more elaborate house to suit the Society Leaders on Polity Hill. You have such a section in your town, haven't you? And don't the people there like nice houses. And isn't there a "Riverside Drive" and "Commonwealth Avenue" and "Euclid Avenue" and the "Parkway"? That is where the fine houses are and it

is where the contractors are making money too. Rest assured that no one will come after you unless you first make yourself known to them.

Just how a contractor should approach the owner on a building proposition depends on both the contractor and the owner, but as a general proposition the more the contractor knows about the owner's business, personal habits and peculiarities, the easier it will be. With a farmer he should know something about

built on, measure it up carefully, see how the ground lies, and make a small sketch of the whole, locating the house, garage, driveway, fences, etc. If there are large trees on the place, see which ones will have to come out and which can be left to adorn the lawns. Make it so real to the man that he can see the finished building with all the surrounding landscape, as you have thought it out. Oh, yes, he will want changes, and so will the rest of the family. And while they are arguing about which rooms they will have, and how they



A Distinctive Bungalow Home. Burd F. Miller, Architect.

the care of cattle, hogs, sheep, etc., as well as spraying fruit trees. With a banker, something about interest, loans, mortgages and the like. When both own fast horses or automobiles or have boys in college, it ought to be easy for the contractor to land his customer.

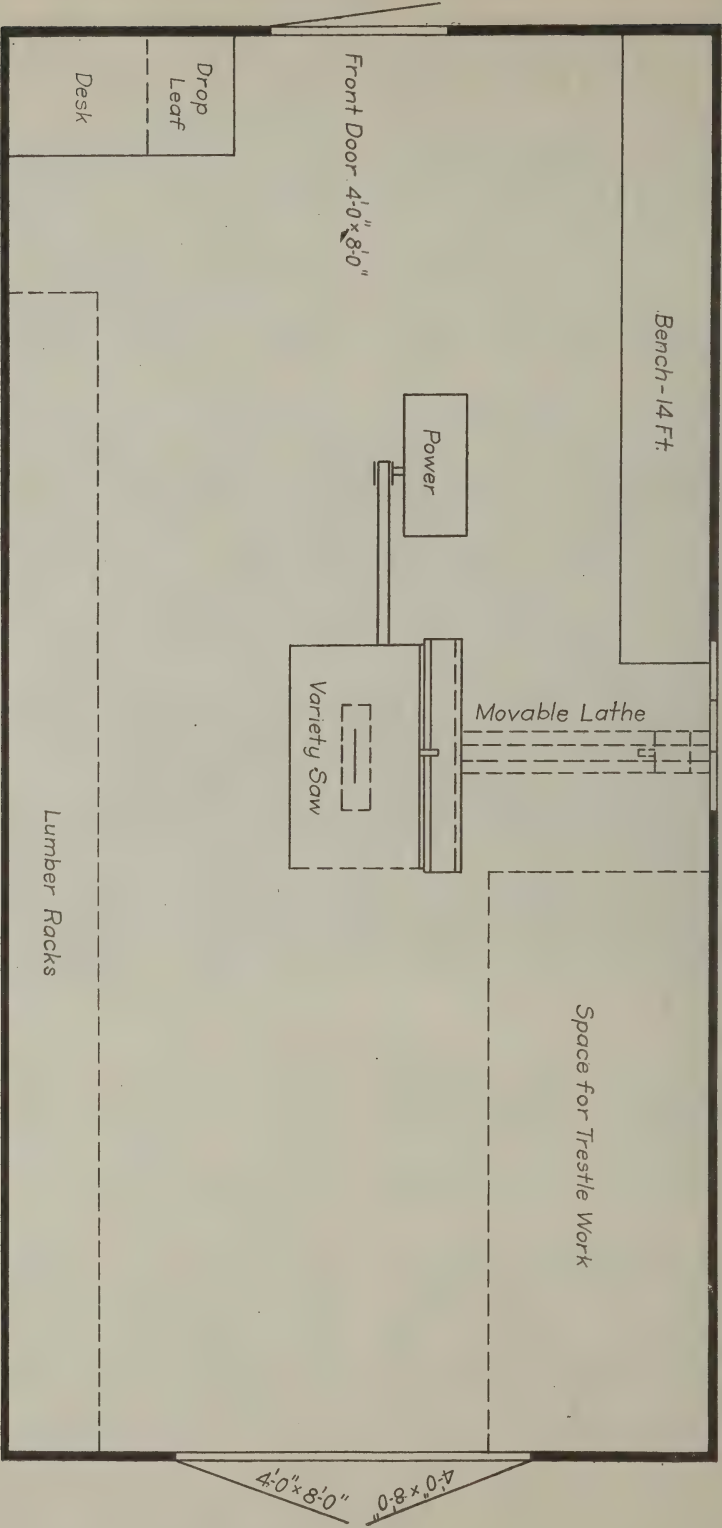
How can the contractor use this plan? Well, just figure who will occupy the various bed rooms and write their names there. Locate the piano, tables, desks, etc. Make the plan look homelike and apply it to the very individual you are going to see.

If you can find the lot which will be

will be decorated, you can be sure your chances are getting better and better. If you get your ideas in shape you won't have to worry about the plan. You will be busy answering questions and getting data on which to work.

Will it pay to go to all this trouble before you are asked to figure on the job? Well, you will *get* the job and that is what you are after. You are giving them real, valuable ideas, which will lessen the chances for disputes later. And you are putting yourself on the map as the Live Contractor in the Town.





# The One Man Jobbing Shop

*Chas. Cloukey*

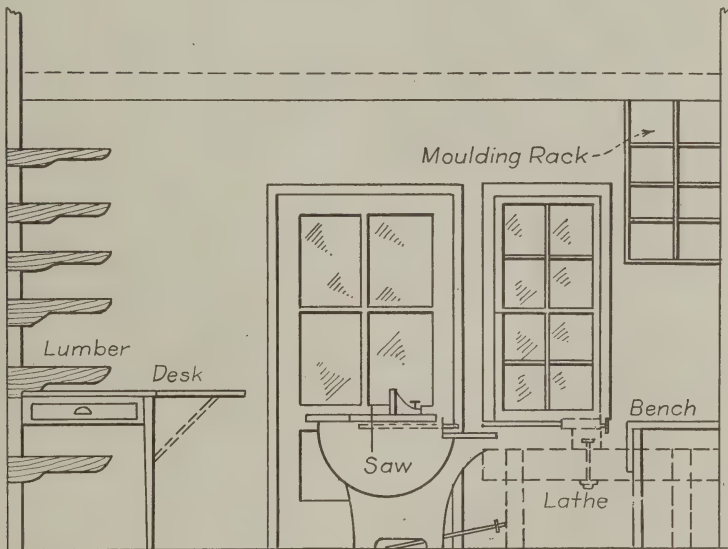
**W**HEN one attempts to lay out an ideal shop on the smallest practical scale, he is at once confronted with the serious problem of elimination, and like the man who had but ten minutes in which to cover a large subject in a speech at a banquet, and who said that he had spent so much time in thinking up the things he should be obliged to leave out, that he had come totally unprepared, the designer of the small shop will have but little left when he cuts out everything for which he will have no room and little use.

The first thing to consider in the one man shop is the room, and the fact that it

To be able to make 2x6 and 2x4 out of 2x10, 2x4 out of 2x8, and 2x6 out of 2x12, and to cut off long lengths readily, may be the means of making the differences between a poor business and a good one.

So we can see at the start that our shop, however small, must have a door in the middle of the back and another in the middle of the front, and a wide window in the middle of one side.

The side window sill must be below the level of the saw table so that the long ends of lumber may extend to the outside. Other windows may be arranged to suit. If the shop is in a store building with no latitude outside of the room, it may in



is a one man shop makes it the more likely to be a room already made and which must be adapted to the work of the shop.

As this one man shop is to have some machinery and as it is to be a jobbing shop which should handle all kinds of work that one man and a helper can manage, certain conditions should be looked out for in the start which will allow the operator to do such long ripping and sizing as will be likely to develop in the lumber yard trade.

some case be impossible to arrange for cutting off of extra long lumber. But the operator will find that the bulk of his custom work will be in ripping.

The shop in the sketch is drawn in proportion to 16 by 32 feet as being about the minimum size which may be used to advantage. If there is a gable roof with open space above the joists, there will be considerable more room than indicated in the drawing. It will be noted that the lumber rack is but 2 feet wide and that the mould-



ing rack is placed above the bench or over the work space as may be desirable. In any case the stock of supplies need not take up much floor space.

If the room could be 40 feet long nearly all of the long work could be done with both doors shut, and if the room could be 24 feet wide instead of 16, so much the better.

Having found his room, the next thought should be the machine or machines he will need or can afford to buy. And although all carpenters may not know it, there are certain combination machines on the market which will come surprisingly near covering their needs for a shop like this. Now I do not mean one of the big combination wood-workers which combine the operation of "16 separate machines," but the rather small machine called the variety saw.

A good variety saw with a table tilting to 45 degrees, with space for the various wooden throats needed, a good rip saw and a coarse and fine cut-off, adjustable dado head and groover, a four inch slotted jointer head all for the front end of the saw mandrel or that part operating from the middle of the table.

These saw rigs have good sliding rip and cut-off gages with mitre adjustments, and the table will raise and lower to suit the work as well as tilt to any angle down to 45.

Now, on the other end of the saw mandrel there is a chuck for holding bits and there is a sliding table which makes a very good boring machine indeed. The standard gang bits for boring pulley stiles can be used on this chuck, and also a chuck for using the hollow chisel mortiser can be easily adapted, thus converting this end of the machine into one of the most useful machines required in any shop.

A further adaptation of the minor end of our machine is to fit up a lathe chuck or center for the machine end and then make a pair of shores and mount a tail stock as indicated in the drawings. This should be rather heavy and movable so that when not in use it may be set aside out of the way. On account of the rather low center of the saw mandrel it may be necessary for the turner to use a stool instead of standing up to his work.

Floor rests for the lathe may be bought of wood working machine houses, but for ordinary or small work the regulation bench rest will answer. The speed of the saw which will probably be about 2,000 will suffice for most of the operations of turning, but will be entirely too fast for large work like newels or porch posts. However, it may be quite possible to slow down the power in some way even to the extent of putting in an extra counter shaft.

Now that we have the machine we must have power to drive it, and if we cannot get electric current at a reasonable price or at all, the next best thing is a gas engine.

Just the amount of power to provide will depend a good deal upon the amount of custom ripping there is in sight. For all ordinary shop purposes a 5-horse power motor or engine will do the business, but if there is much 2-inch ripping to be done, an extra 3-horse power will soon pay for itself. So I would say to get an 8 or 10-horse power motor of some kind unless the work is to be strictly confined to constructive operations in the shop.

A reference to the diagram will show a corner of the shop at the rear of the bench to be devoted to trestle work or such operations as require putting up on the trestles. Of course the reader will understand that the shop has this advantage over a factory in that the spaces around the machines do not have to be kept clear all of the time, but for nearly all of the time may do the double duty of bench and machine room both.

As to the additional equipment needed in a shop of this character, besides a full assortment of carpenters' tools, there should be all of the machine bits needed, including one each of 5/16, 3/8 and 1/2 inch hollow chisel mortisers with about 3 bits apiece as the operator is likely to twist off a few while learning to use them with the proper moderation. Then he should have a relisher bit, for if he does much tenoning as he is likely to do after he gets onto the way of doing it, he can bore off his relishes and then rip them on the saw.

I might say in regard to the relish bit, that there is danger of a good deal of annoyance on account of the screw point of the bit running out of the thin tenon and

raising or moving the piece or rather, making it hard to hold in place. The remedy is to grind off the screw point and file the lips over until they pass each other at the center of the bit. With the treadle feed the bit can be forced in quite readily and one can bore half a hole if required.

As a job shop should be able to do a certain amount of scroll work, and still it would seem that the installation of a bandsaw would be most too expensive a proposition for a one-man shop, I would suggest the purchase of a good foot power jig-saw, and for the same reason would not advocate the purchase of a power grinder or emery wheel. Nearly every carpenter has a tool grinder of some sort

and the addition of the machinery will not add very materially to his grinding anyway.

For lathe tools, he will need about 4 straight chisels from  $\frac{1}{4}$  inch to  $1\frac{1}{2}$  inch, 4 gouges,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$  and 1 inch. Of course he could use more turning tools, but he can do about all kinds of straight work with those mentioned. Unless he has special arrangements in an outside thread on the end of the saw mandrel on which to screw a faceplate, he will not be able to do that kind of turning; but if his machine is bought new from the manufacturer, he would be able to have that preparation made at a very small additional cost.

# Engineering For the Contractor

## Ninth Article

THE contractor is often called upon to do a number of odd jobs, not exactly included in the general line of contracting. Sometimes a customer wants to satisfy himself as to the size and shape of his lot or farm. Can the contractor do this with his Convertible Level or Transit? Most certainly, and it is not such a hard job either. Theoretically it is complicated, but practically it is within the capacity of anyone who can add a column of figures and sight through the telescope.

If a Contractor should set himself up as a Surveyor—his work would be far more difficult and would call for a technical education and training. He would not get very far as an expert witness in court, but he can make a sufficiently close approximation for any ordinary purpose.

The system suggested here is not the one which would be followed by a surveyor or trained engineer, but it has the merit of avoiding practically all the higher algebra and trigonometry in which a scientist delights. It will enable the contractor to make such plans as will enable a surveyor to check him up or possibly serve as an approximate survey for any one of a dozen purposes.

The base of all surface calculation is the triangle, and two rules are all that are necessary to find their areas. It is of course apparent that any plane figure can be di-

vided into triangles by drawing lines to each angle. The first rule is. The area of a triangle is equal to the base multiplied by one-half the altitude. It is easy to find the base, that is any side, and the altitude is the perpendicular distance to the opposite angle. This is easy to find on paper, but often exceedingly difficult in the field, perhaps with trees and buildings in the way.

The second rule considers the three sides of the triangle and a rather complex rule of arithmetic must be followed. The area of any triangle may be found by the formula  $\text{area} = \sqrt{s(s-a)(s-b)(s-c)}$ , when  $s$  equals one-half the sum of the three sides  $a$ ,  $b$  and  $c$ . Expressed in other words, the area of any triangle equals the square root of one-half the sum of the three sides multiplied by the difference between the half sum and each of the three sides.

Get this rule or the formula firmly fixed in your mind for it is the basis of all the calculation you need make to determine the area of *any* figure, unless the sides are curved, and such areas require a little different consideration.

When we have a plot of ground and wish to know its area we should first make a rough sketch of its shape. This need not be exact or to scale, but the better it is in proportion the easier the subsequent work will be. Having the plot blocked out, see



where lines can be drawn to form triangles which shall cover the entire area.

Determine accurately each corner, as you must measure to it exactly, and set your instrument over it. Suppose the plot is shaped about as in Figure 13, and you find you can run lines best from the point B. We find A is a right angle but all the others vary as shown.

We will start at A and sight to B. Clamp the angle plate at  $0^{\circ}$ . Now with a steel

although it is good practice to read them off. It might help in checking the work too, but if carefully done there is no need of measuring.

Now having all the necessary measurements, we have our choice of the two triangle methods. We can lay the plot out on a drawing board to scale, and *measure* the altitudes of the various triangles. This is possibly the easiest way, so we will do it this way.

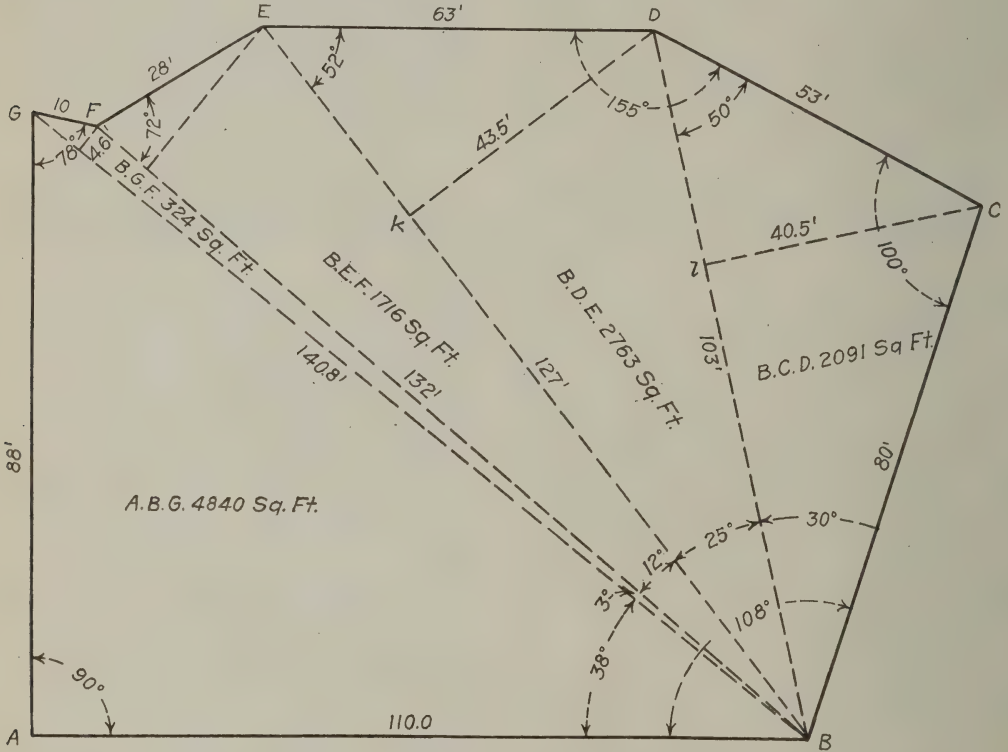


Figure 13

tape held as nearly level as possible measure the distance from A to B. If it is more than the length of the tape you must locate a point between, but in line with A-B. Swing the telescope around to G. It makes 90 or a right angle. Measure the distance to G. Keeping the course straight by sighting through the instrument.

Now set up at B, sight and measure to C, D, E, F and G and get all the distances accurately. Then set up at C, D, E and F, obtaining the remaining distances at sides of the triangles. Never mind the angles, you don't need them for this work,

The triangle A, B, G has a base 110'O" and altitude 88'O". Its area is therefore

$$\frac{110 \times 88}{2} = 4840 \text{ sq. ft.}$$

In like manner:

$$BFG = 324 \text{ sq. ft.}$$

$$FEF = 1716 \text{ " "}$$

$$BDE = 2763 \text{ " "}$$

$$BCE = 2091 \text{ " "}$$

$$\text{Total } 11734 \text{ sq. ft.}$$

Thus the entire plot contains 11734 sq. ft. or close to one fourth acre. An acre contains 43560 sq. ft.

To Be Continued.

# Some Notes on the Steel Square

Figure 24 exhibits the plan of an eight-sided hopper.

To find the angles to cut the sides and miter the edges when the run and rise of the sides are equal. Place the square on the side, with A D, the width, on the blade, and B N, equal to half the length, on the tongue; mark from the tongue for the cuts required. Or, by the use of the figures 18 inches on the blade and  $5\frac{3}{4}$  inches on the tongue, mark from the tongue for the cuts required.

To find the angles to cut the sides and

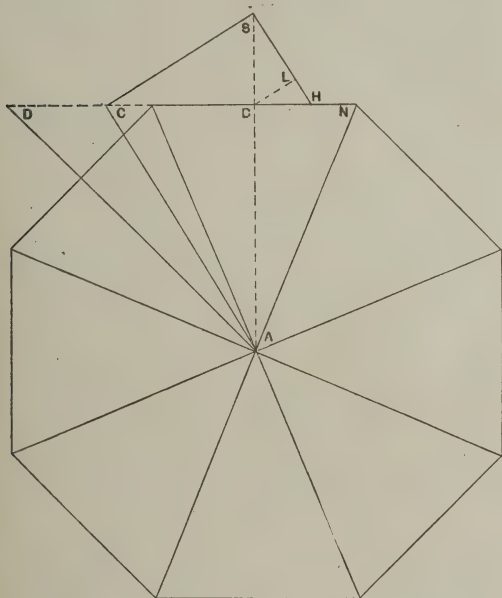


Figure 24

miter the edges when the run and rise of the sides are unequal. Draw A C B, the angle of elevation required, and S L parallel to C A, C S at right angles to C A. Place the square on the side, with A C on the blade, and B N on the tongue; mark from the tongue. Place the square on the edge, with C H on the blade and B L on the tongue; mark from the tongue for the cuts required.

Note.—If the angle of elevation exceeds  $45^\circ$  reverse the operation.

Figure 25 exhibits a right angle, for a box or hopper.

To find the angles to cut the side and

miter the edges when the sides are placed at any angle oblique to the base.

Draw T H, the base, H B and C P, the sides, to the angle of elevation required.

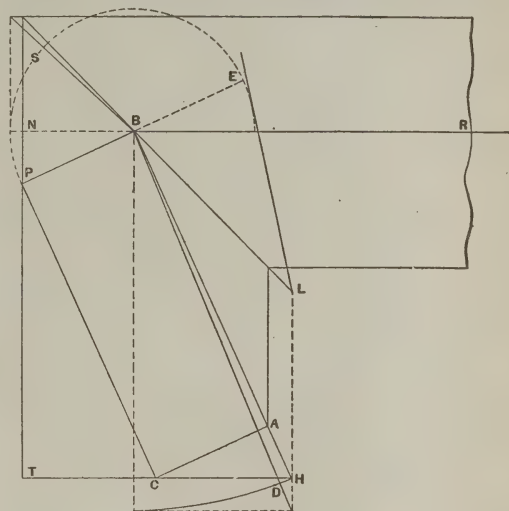


Figure 25

To find the angle to cut the sides; from the point B as center, describe the semi-circle P E, and the arc from the point H; tangent to the arc, and parallel to C H, draw

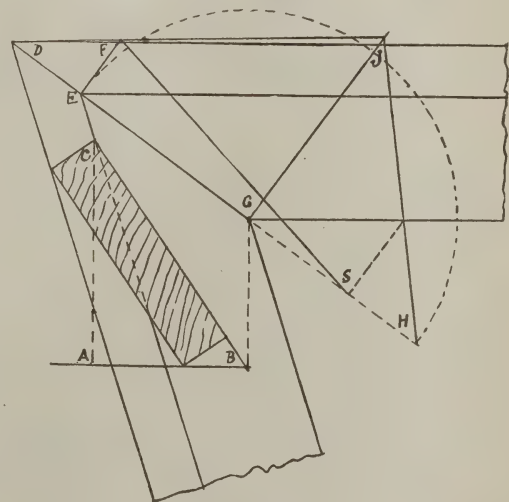


Figure 26

the dotted line, cutting the line L H extended at the point D; join D B. Then B S N equals the angle to cut the miter, D B R equals the angle to cut the sides,





on the tongue; mark from the tongue for the angle to cut the edge. Place the square on the edge, with E D on the blade and E R on the tongue; mark from the tongue for the butt joint required.

Figure 28 exhibits the plan of a right angle.

To find the angles to cut the sides and miter the edges when placed at any angle of elevation oblique to the base. Draw the base A B equal the run; set up from B to C, equal the rise; join A C, the side; draw C D at right angles to C A; from the points A and D as centers, describe arcs from the point C, cutting the line A D at S and H. Then A R S equals the angle to cut the side A C, and D P H equals the angle to cut the edge C L. When the elevation of the side A C equals  $45^\circ$ , or when the run and rise are equal, the angle to cut the side, edge and butt joint are equal.

By the use of the square. Place the square on the side with S A on the blade, and S R on the tongue; mark from the tongue; place the square on the edge, with H D on the blade, and H P on the tongue; mark from the tongue for the cuts required.

Figure 29 exhibits the plan of an acute angle.

To find the angle to cut the sides and miter the edges, when the run of the sides and the angle of elevation are unequal.

Square up from A to B, and C, equal the run of the sides. Set off from B to D, and from C to E, equal the rise; then A D B, and A E C, equal the unequal angles of elevation, A D and A E the width of the sides.

To find the angles to cut the sides A D and A E. From the point A as center describe the arcs D F and E R; tangent to the arcs, draw F H and R S parallel to D B and E C; join A H and A S. Then A H F equals the angle to cut the side A D, and A S R equals the angle to cut the side A E.

To find the angles to cut the edges. Square up from N to the point F. Then N F A equals the angle to cut the edge D L, and N H F equals the angle to cut the edge E P.

By the use of the square. Place the square on the side A D, with F H on the blade, and F N on the tongue; mark from the blade. Place the square on the edge D L, with N F on the blade, and N A on the tongue; mark from the latter. Place the square on the side A E, with R S on the blade, and R A on the tongue; mark from the blade. Place the square on the edge E P, with N H on the blade, and N F on the tongue; mark from the blade for the cut required.

(To be continued)

# Architectural Drawing Lessons

## Twenty-Second Paper

**A**N authority says: "The subject of working drawings is one to which a draftsman cannot give too much attention, for accurate plans and details are absolutely essential to the production of good buildings. It is well to bear in mind that working drawings are working drawings and not pictures. They should merely aim at accurate diagrams setting forth exactly the work which is required to be done, with such dimensions as are necessary clearly figured on the drawings, and the conventional colors employed to indicate materials whenever they will aid in expressing the draftsman's intention. Anything beyond this is not only a waste of time, but is likely to mislead the contractor and his workman. Violet shadows and brown ink may possibly appeal to the

client, especially when used in conjunction with pale green lettering, but the builder is rarely susceptible to "art," and merely sees in the drawings put into his hands something which will explain and supplement the specifications.

In all such drawings the utmost care and cleanliness is required, for dirty T-squares and set-squares mean too much use of the India rubber and too much India rubber means spoiling the surface of the paper, and leads to blurred lines and colors. Beyond the primary precaution of cleaning all instruments, it is advisable to so set out drawings that penciling and inking are begun at the left-hand top corner of the paper, and the work continued across and downwards, so as to avoid blurring by re-



peatedly passing the T-square and angles over finished portions of the drawing.

For all ordinary purposes working drawings may be divided into three heads: Drawings to the scale of  $\frac{1}{8}$  or  $\frac{1}{4}$  inch to a foot, drawings to the scale of  $\frac{1}{2}$  inch to the foot and full-sized details. Of these by far the most important are the first, as they constitute the chief contract drawings and include plans of each floor (and of roof and foundations very frequently also), elevations of each front, and at least two sections through the whole building. Among the contract drawings should be included a block plan—to a convenient scale, or as required by the local regulations—drawings to the scale of  $\frac{1}{2}$  inch to the foot of any portion of the building which may seem to require more detailed explanations. These latter, however, come under the second head.

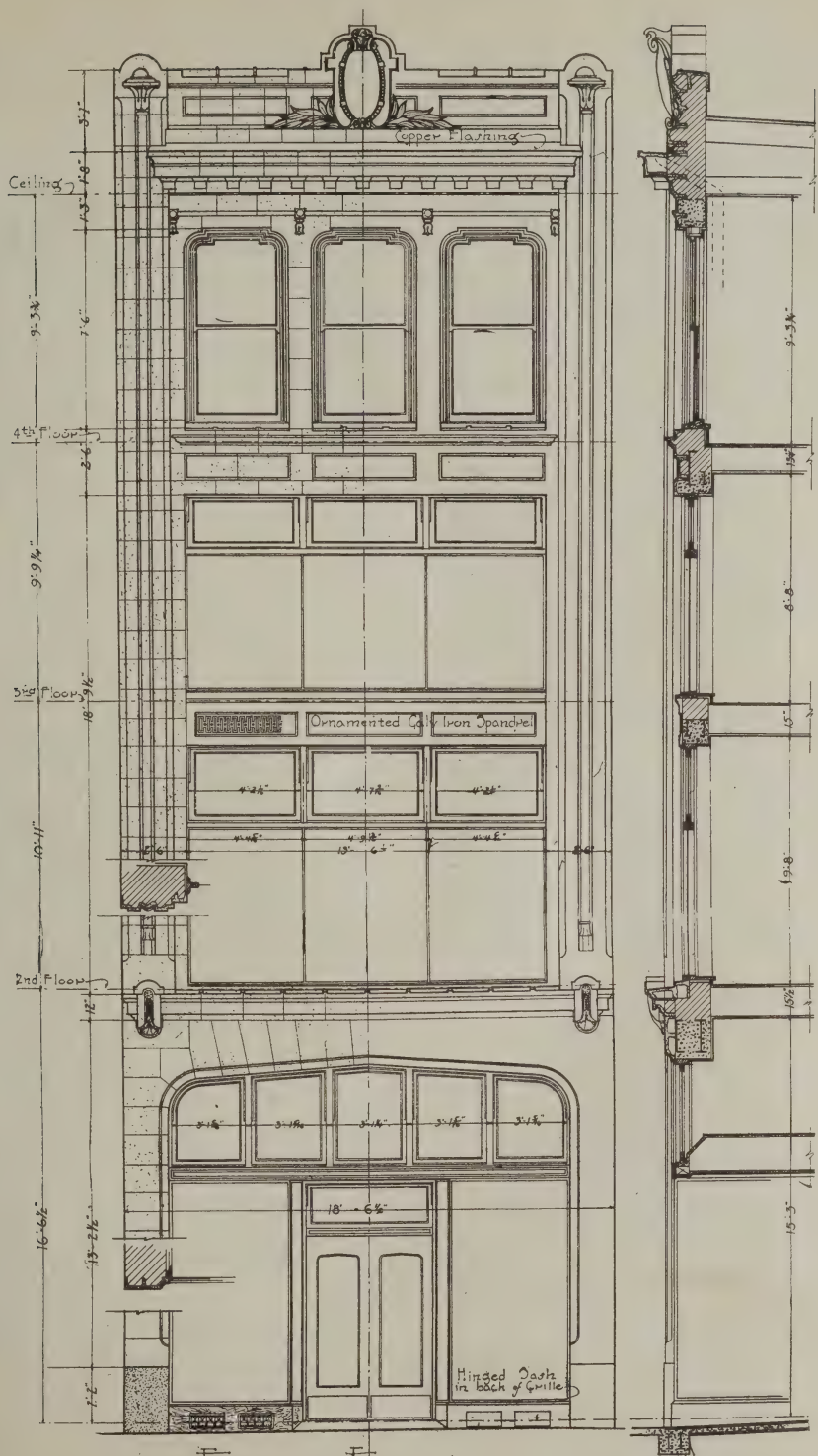
Should the building be a large one, it will be found advisable to have contract drawings made on blue print cloth. It is suprising the amount of knocking about and rough handling these drawings have to suffer during the progress of a contract. Concerning the actual drawings, there is little to say beyond emphasizing the necessity for careful thought and accuracy. It is useless to place a 14-inch wall and fireplace on the first floor with only a  $5\frac{1}{2}$ -inch partition on the ground floor. It is wisest to build on paper as the contractor will in material, beginning from the foundation and working carefully upwards, drawing a plan, section and elevation in turn until the whole is complete in pencil. For instance, fireplaces below must find room enough in the chimney breasts above their flues, and the stairs must be sufficiently given in detail for no doubt to arise as to headroom.

The principal object of  $\frac{1}{8}$  or  $\frac{1}{4}$  scale drawings is to present a general scheme of the whole work with all the sizes of the various rooms, positions of openings, thicknesses of walls, and chief features. It is of the utmost importance, therefore, that all the dimensions be fully worked out and figured on the plans. All part-dimensions, when added together, must agree with the total through-dimensions, and these are probably best worked out partly by measurements on the plan and by calculation on waste paper. For instance, if a house

has parallel sides, each set of dimensions right across must total the same; but if each part dimensions were figured on exactly to what it appeared to measure on the plan errors would undoubtedly arise, as with a scale of  $1/96$  full size it is impossible to plot accurately to every half-inch, so that these dimensions have to be adjusted and corrected by the known through-dimensions.

These " $\frac{1}{8}$  or  $\frac{1}{4}$ " scale drawings are first made on paper and when fully completed are traced on tracing cloth in ink. Care must be taken that no superfluous lines, such as showing brick or stone courses, beamed ceiling lines, mouldings, etc., be put on in such a manner as to mislead the builder. As the drawings are purely working drawings, they had best be well lettered to give all possible information, both as to dimensions and materials. It is better to have the information repeated on the several drawings and in the specifications than to be omitted in one or the other to the possible confusion or mistake of the contractor or owner. The section lines should be very clearly and correctly marked on every plan, and are best represented by a bold line of alternate dots and dashes; for if an ordinary solid line is used it is liable to confuse the plan and suggest a difference of level. All the dimensions—which, as already said, must agree always with the totals—should be printed with limiting lines and arrows to show clearly and exactly how much of the plan is included in the given dimension.

The " $\frac{1}{2}$ -inch details" include almost every portion of the building, and a good set of  $\frac{1}{2}$ -inch drawings would illustrate every door, window, staircase, rooftruss, gable, skylight, etc., contained therein. As already hinted, some of the drawings to this scale are frequently made part of the contract drawings, so that important features are irrevocable in nearly all their details before the building is begun. This is of the utmost importance always, but especially so when an architect is obliged to give the work to a contractor who is known to have cut down his estimate to a ridiculously low figure. In such a case the contractor will very possibly be always on the watch for omissions from specifications or contract drawing to enable him to claim extras, and so make up by profit on these for



FRONT ELEVATION  
Figure 149



lack of profit on the contract. If, however, he is made to sign, among the other drawings, a  $\frac{1}{2}$ -inch drawing of one bay of the front, or of any important paneling in the hall, or marble terrace or whatever elaborate features there may be included in the work, it will deprive him of half his opportunities for claiming extras, as naturally he cannot dispute his own signature.

All  $\frac{1}{2}$ -inch details other than those just referred to are drawn in conjunction with the full-size details and holds the same relationship to them that the  $\frac{1}{8}$ -inch scale drawings do to the  $\frac{1}{2}$ -inch details. They serve, that is, as a key diagram, showing in miniature the whole of the feature detailed, and give the principal dimensions of all the same, and the relative position of all the parts, mouldings, etc. They should supplement the smaller scale drawings, and should follow all the dimensions in the smaller scale drawings. Preferably they should be prepared before the contract is signed and made a part of the contract drawings.

In getting out the work, the contractor may follow either the drawings or the work under construction, for when the walls are up and the floors in, it may be easier and safer to work from the building rather than from the drawings. As the work can then be seen in its finished relation to the building, the contractor and owner can get a better idea of the finished appearance, and the contour of mouldings, heights of chair rails, etc., can be better understood.

As with the  $\frac{1}{2}$ -inch drawings, the full size drawings should preferably be prepared before the contract is signed, so, on the one hand, the contractor will know exactly what he is required to furnish, and so need not add a guessed-at sum for contingencies, and, on the other hand, the owner will see what he is to get and can insist upon its being furnished. No more fertile ground for trouble exists than in half prepared plans in which the contractor is trying to furnish only what is clearly shown while the owner is insisting on what he thought he was going to have.

But, whether or not the full size details are prepared, before or after the contract, they should only amplify and not change, the small scale or  $\frac{1}{2}$ -inch drawings. Sometimes only one set of these full size drawings are made, and then only in pencil, and this is true especially where the material man must make his own drawings. The latter must be approved by the architect or contractor before they are used, and take about the same position as samples, models, etc. Small models are also sometimes prepared in this way, as it is impossible to design on a flat piece of paper any ornament which presents facets to every point of the compass. Whether this should be done by the architect or the carver, who would, of course, submit it to the architect for approval, is a matter of opinion. The ordinary full-size detail of mouldings requires but little notice, but it may be as well to warn beginners that curves that look graceful on the drawing and section do not necessarily look beautiful when cut in stone or run in plaster, especially if they have been drawn out with no consideration of their relative position to the point of view.

And here it may be advisable to say a few words with regard to the methodical execution of a complete set of drawings for buildings from the moment when the architect and his client have agreed upon the exact arrangement of the house. When the bills of quantities are out, tenders received, and the builders selected, the contract drawings are signed by the contractor and the building owner. These drawings then become legal documents, and no alterations may under any circumstances be made in them, unless with the sanction of and initialed by both parties to the contract. Prints of the contract drawings should be made on cloth, while all other prints may be on paper.

At Figure 149 we show a very artistic store front, which will not be difficult to follow and which we would advise the student to copy. It will make excellent practice and tends largely to give him an insight into some of the rules of architecture.

(To be continued.)

# Mathematics and the Builder

*M. E. Davis, B. S.*

## GEOMETRY.

THE subjects dealt with in preceding articles have very little practical value to mechanics. However, do not mistake this statement to mean that a knowledge of these subjects can be dispensed with. They are not only great mind trainers, but to follow the subject of mathe-

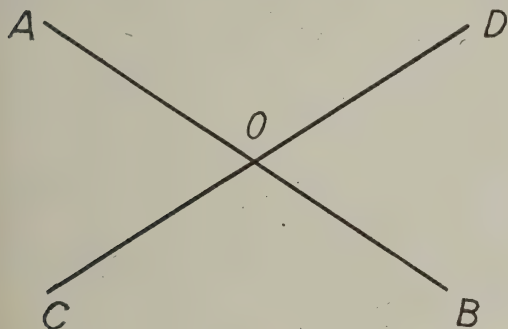


Figure 1

matics farther without a knowledge of arithmetic is impossible. These two subjects are the foundations upon which the great science is built.

That part of geometry which is most useful to the mechanic are the problems of construction and of mensuration. But in order to thoroughly understand these problems it is necessary to understand at least a part of the theory of geometry. To cover the whole of the study in a couple of short articles would be impossible. Therefore, this article will present the theorems necessary to understand the more useful problems.

Geometry is divided into two parts: Plane and Solid. Plane geometry deals with points, lines, angles and plane figures—that is figures whose component parts lie all in the same plane. Solid geometry deals with planes and solids.

Theoretically a point has no dimensions whatever. Likewise a line has only one dimension, that of length. A plane figure has two dimensions only, length, and breadth or width.

An angle is formed by the intersection of two straight lines. For convenience an angle is named by the letters of the alphabet.

Thus angle ABC denotes the angle formed by the intersection of the lines AB and BC. The letter at the intersection is always placed in the middle. The length of the intersecting lines has no bearing upon the size of the angle. The size of an angle is measured by the number of degrees of a circle intercepted between the sides, every circle being divided into 360 degrees.

The proof of a geometrical theorem depends upon statements known as axioms. An axiom is a statement whose truth is so apparent that it needs no proof. Some axioms are as follows:

Things equal to the same thing are equal to each other.

The same thing subtracted or added to equals will result in equals.

Equals divided or multiplied by equals will result in equals.

Things which coincide, so that one part of one fits the corresponding part of the other, are equal.

It would be advisable to state at this point the definition of a straight angle. A Straight Angle is an angle whose sides lie in the same straight line and is equal to 180 degrees.

An understanding of geometrical problems can be accomplished with the knowl-

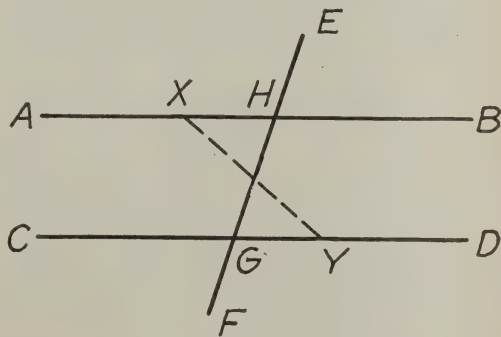


Figure 2

edge of very few theorems. We will now take up the necessary theorems.

Theorem 1. All vertical angles are equal.

Def. Vertical angles are opposite angles formed by two intersecting straight lines.



Let  $AB$  and  $CD$ , in Figure 1, be two intersecting straight lines. Then the angles  $AOD$  and  $COB$  are vertical angles. To prove that the angle  $AOD$  equals the angle  $COB$ .

The angle  $AOD + \text{angle } DOB = 180^\circ$ .

The angle  $COB + \text{angle } DOB = 180^\circ$ .

Since things equal to the same thing are equal to each other

Angle  $AOD + \text{angle } DOB = \text{angle } COB + \text{angle } DOB$ .

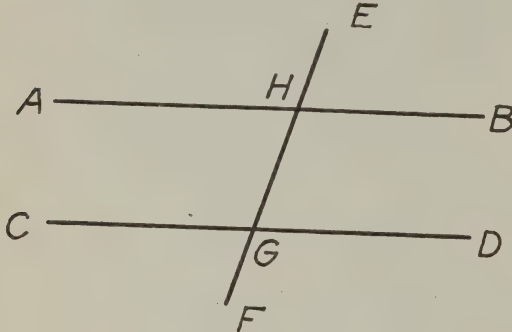


Figure 3

Subtract the angle  $DOB$  from both sides of the equation, and we have

Angle  $AOD = \text{angle } COB$ .

Theorem 2. If two parallel lines are intersected by a third line, the alternate interior angles are equal.

Let  $AB$  and  $CD$ , in Figure 2, be two parallel lines intersected by a third line  $EF$ . The angles  $AHG$  and  $HGD$  are alternate interior angles. To prove that the angle  $AHG$  equals the angle  $HGD$ .

Suppose a line such as  $XY$  drawn through  $O$ , the middle point of  $HG$ . Revolve the tri-

angle  $OGY$  about the point  $O$  until the line  $OG$  falls along  $OH$ . Point  $G$  will fall on point  $H$ , since  $OG$  equals  $OH$ . Then line  $GY$  will fall along  $HX$ , since  $GY$  is parallel to  $HX$ . Therefore the angle  $OGY$  coincides with the angle  $OHX$ , and is equal to it. Hence the angle  $AHG$  equals the angle  $HGD$ .

Theorem 3. If two parallel lines are intersected by a third line the exterior interior angles are equal.

Let  $AB$  and  $CD$ , Figure 3, be two parallel lines intersected by the third line  $EF$ . The angles  $EHB$  and  $HGD$  are exterior-interior angles. To prove that the angle  $EHB$  equals the angle  $HGD$ .

By Theorem 1, the angle  $EHB$  equals the angle  $AHG$ .

By Theorem 2, the angle  $HGD$  equals the angle  $AHG$ .

But things equal to the same thing are equal to each other. Therefore, the angle  $EHB$  equals the angle  $HGD$ .

Theorem 4. If two parallel lines are intersected by a third line, the alternate exterior angles are equal.

Let  $AB$  and  $CD$ , Figure 3, be two parallel lines intersected by the third line  $EF$ . The angles  $EHA$  and  $FGD$  are alternate exterior angles. To prove the angle  $EHA$  equals the angle  $FGD$ .

By Theorem 3 the angle  $EHA$  equals the angle  $HGC$ . By Theorem 1, the angle  $DGF$  equals the angle  $HGC$ .

But things equal to the same thing are equal to each other. Therefore, the angle  $EHA$  equals the angle  $FGD$ .

(To be continued.)

## Creosote For Shingle Stains

*A. Ashmun Kelly*

**C**REOSOTE has such a strongly pronounced odor that when we detect any other smell on it the conclusion is reached at once that it has been doped, usually with benzine, and any stain for shingles is rendered very inferior when benzine has been added. Yet the heavy, "dead oil" or creosote is often thinned down, even by some manufacturers, in the effort to reduce its body and get a lighter color. Coal tar creosote particularly is dark, and if used without being greatly lightened in color with some light thinner

it would be too strong, killing any color that might ever be placed over it, or causing a brownish or black streakiness on the roof, and of course spoiling the effect.

Wood creosote is largely used in the manufacture of shingle stain, and sold as creosote oil; it is very light gravity oil of strong color and smell. Sometimes japan is added to it to give color, but this must be regarded as an adulteration, for anything that produces evaporation will destroy or greatly impair the value of the stain as a preservative.

A good creosote shingle stain is quite satisfactory as regards color and wear, while its preservative qualities are all that could be desired. Any shingle stain ought to be transparent of color, to give the best effect as a stain. Water is not to be thought of as one of its constituents, and the use of any poisonous pigment is both undesirable and unnecessary.

There are several substitutes used for shingle stain, the liquids being crude petroleum oil, kerosene, benzine, and similar mineral oils.<sup>4</sup> These are colored variously. But these mineral oils will not mix with creosote, although, as previously stated, the mixture is attempted. Here is a typical formula for making a cheap substitute stain for shingles: Water-white, 150 deg. petroleum oil, three gallons; creosote oil, three gallons; liquid drier, one gallon. Add any coloring desired. It is very evident that any such formula will give but a very sorry shingle stain. Stains are also made from raw linseed oil, with some thin fluid like benzine or turpentine, to enable the oil to enter the wood better; any desired color may be added. The objection to oil is that it is not a preservative in the sense that creosote is, its ability to preserve depending upon the coat it forms, and this we know is not proof against water, but will decay in time. Creosote preserves the tissue of the wood against the causes of decay or rot, and it is the only thing that does this. Hence if a customer will go to the expense and wants a treatment that will make his shingle roof proof against rot, whether dry or wet rot, here is what to give him. It may be observed, too, that a creosoted roof holds color better than any other form of stain. It will not, of course, retain the original color for years, but it will present a uniform and agreeable coloring for a very long time. I have a roof done with the best creosote stain fifteen years ago, and the color effect, in the way I have described it, is fine. It cost a good deal to creosote that roof, the total cost of the roof, including the stain, having been \$300, but it is some roof. A medium size barn roof.

In cold weather creosote stain is apt to become thickened, on account of the more or less solid naphthaline always found in

creosote. Keep the fluid, when not in use, where the temperature will be above 40 deg. Fahr., and if it becomes affected by the cold while in use, fluidity may be restored by heating it slightly. Never make the mistake that some painters make when their oil paint stiffens in cold weather—adding oil to make it fluid again. This would, of course, only make it that much lighter of body.

Creosote contains more or less sulphur, hence not all pigments act well in it. Such as contain lead, for instance, will cause the stain to take on a muddy or darker hue. But dark creosote may be used with a dark pigment, such as dark green, while the light stains may be colored with yellows, etc., the latter being the refined creosote. Refined creosote oil has very nearly all its sulphur taken out, and will take nearly any pigment, being inert.

Here are the marks of a first-class creosote stain: It should be a little heavier than water. It should have a deep brown color, with perhaps a slightly greenish tinge. It should have the true odor of carbolic acid. A few drops placed on white blotter paper should give a clear brown spot, and if the spot has a very dark center the creosote is either doped or carelessly made; reject it. It should be free of crystals or deposit, and should show no thickening at 40 deg. Fahr.

The way to treat shingles, for best possible results, is to dip them about two-thirds their length in the creosote, and allow them to dry. Then after they have been placed on the roof give them a brush-coat of the stain, which will greatly prolong the life of the color, and also add to the preservative qualities. In this way no part escapes the stain that is exposed to the air. Stir the stain frequently, to maintain a uniform color and fluidity. Another advantage of dipping is that it prevents warping. On the roof I have alluded to a warped shingle is rare, while on another roof I did, house roof, and where the best shingles were bought, and day's work employed in the laying, a perfectly flat and whole shingle is very rare. Reason, I did not creosote this roof, nor treat it in any way to protect it.



# OUR READERS PAGES



[The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessarily for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experience will be given proper space.—Ed.]

## Answers

### COLORING CEMENT.

From the C. J. Osborn Co., New York:

In answer to "Plasterer," Ohio, regarding coloring concrete. We note that this party desired to use color in cement. You can not use paints or stains, but must use a pure mineral cement color that is free from clay, gypsum and organic matter.

We recommend that he use an average 5 lbs. of color to every bag of cement, with the exception of green, in which instance use 7 lbs., and in the case of black use 2 lbs. in 1 to 2½ mix.

### COLORING CEMENT.

From "X-Rays," Toledo, O.:

In reply to Plasterer of Cleveland:

I submit the following formula for coloring cement, which I am sure he will find to be satisfactory, and I might say durable. The colors will not fade if the directions are closely followed. These recipes were given me some years ago, and I find, that wherever tried, they have proved to be all that was expected of them. The quantities given are per barrel of cement, the coloring matter in each instance being mixed dry with the cement and sand. Caution is given that venetian red and common lampblack should not be used, as the color obtained with these materials will run and fade. The various colors and quantities of coloring materials for each barrel of cement are as follows:

For brown, 25 lbs. of best roasted iron oxide; or 15 lbs. to 20 lbs. of brown ochre.  
For black, 45 lbs. of manganese dioxide.  
For blue, 19 lbs. of ultramarine.  
For buff, 15 lbs. of ochre. (This is likely

to considerably reduce the strength of the mixture.)

For green, 23 lbs. of greenish-blue ultramarine.

For gray, 2 lbs. of boneblack.

For red, 22 lbs. of raw iron oxide.

For bright red, 22 lbs. of Pompeian or bright vermillion.

### COLORING CEMENT.

From "W. G. R.," in answer to "Plasterer," Ohio:

In using coloring matter with concrete, the color should always be mixed with the cement dry, before any sand or water is added. The mixing should be thorough, so that the mixing is uniform in color after this mixing. The combination is treated in the same way as clear cement, and the following table will give good results:

Color	Mineral	Lbs. of Color to 100 lbs. of Cement
Gray	Germantown Lamp	
	Black .....	¼
Black	Manganese	
	Dioxide .....	12
Blue	Ultramarine .....	5
Green	Ultramarine Green	6
Red	Iron Dioxide.....	6
Bright Red	Pompeian or English Red.....	6
Sandstone	Red-Purple Oxide of Iron.....	6
Violet	Violet Oxide of Iron .....	6
Brown	Roasted Iron Oxide or Brown Ochre .....	6
Yellow or Buff	Yellow Ochre.....	6

## DRYING LUMBER.

Answering H. L. B., East Earl, Pa.:

It will be possible for you to dry the lumber with a 30 H. P. boiler, but it will probably cost you more to fit up a suitable place than it would to haul the lumber to the nearest kiln.

Briefly, the process of drying lumber consists of building a big, air-tight box and heating it with a steam coil. The heat, of course, takes up the moisture and you must provide an inlet for fresh air and an outlet for the heated air which carries off the moisture.

You will probably have more or less trouble in finding the correct temperature to keep the kiln at, as it varies with different woods and different conditions.

We, therefore, suggest that unless you have some one who understands this subject thoroughly it would be better to haul the lumber to the nearest kiln.

The above refers to drying lumber as quickly as possible. Lumber will dry, season and dry out in time, if it is kept in a moderately warm room, under good cover. For instance, if you keep the boards well separated in a temperature of 100 degrees for several months during the winter it would dry out possibly as well as you could get it from a kiln.

## BOX SHUTTERS.

From "Veteran Joiner," Detroit, Mich.

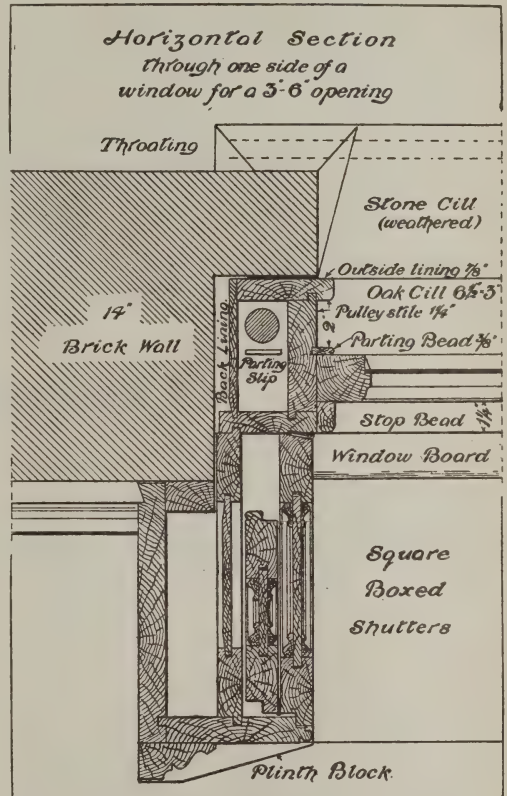
Nearly every book on carpentry contains a scheme of some kind for building in some sort of "box shutters," but for fear "Young Workman" may not have access to the right sort of books, I send the following, which is taken from one of Hodgson's works on Carpentry, and which is quite easy to follow. This diagram shows a boxing for a 14-inch, or brick and a half wall, but should "Young Workman" require his box and shutters for a 9-inch, or single brick wall, he will have to reduce the length of box-in-section considerably in order to meet the requirements. This will not be a very difficult task, as "Young Workman" will soon find out.

## CIRCLE ON CIRCLE.

From "Greybeard," Keokuk, Iowa:

I have been in this country now more than forty years, and have worked at my

trade all the time ever since I left Aberdeen, Scotland, and have never yet had occasion to work on a "Circle on Circle," though I have served my time in carpentry, where an apprentice who could not lay out and cut up the stuff covering the work, and finish the same, was not a fit young man to be turned out on the world as a finished workman by any means. However, I send for the information of "Amateur Workman" the working lines, which will help

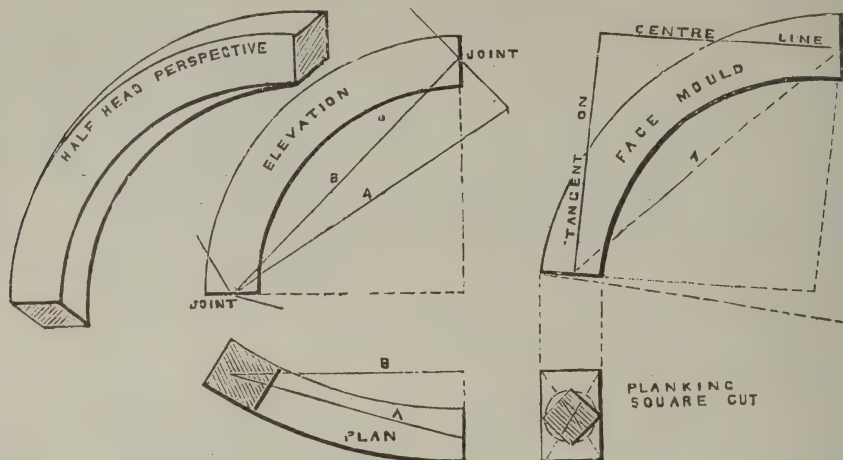


him out a little, but, of course, will not be enough to cover all sorts of windows or doors. A tracery window will take several face moulds and bevels, which would take up too much space to describe. I would advise A. W. to employ a practical man, or he may be placed like some of our builders, i. e., have enough material spoiled to do the job before it is properly commenced. However, if "Amateur Workman" fancies himself competent let him set out from my rough sketches, say to his dimensions on half real size; get out a face mould similar



to the one I have sent, and apply it on a piece of pine plank; line from the mould and have the plank cut square; make joints

with bevels; this done, "A. W." can wire in with his mallet and gouge and take the useless wood away, and so shape his head;



from bevels, then apply the bevels for horizontal faces, and again apply the face mould on both sides of plank to coincide

if he spoils a model it will not be much loss, and it will give him some knowledge how to begin the thing in reality.

## Questions

### POWER MACHINERY

From "W. T. R.," Blytheville, Ark.:

I have installed a small saw rig, rip, cut-off and dado, and would like to have someone who has had experience with power machinery of this character advise me how to do "stunts," work out of the ordinary on these.

### CONCERNING COST SYSTEM.

From "R. S. G.," Ontario:

Will some reader kindly publish through the columns of the NATIONAL BUILDER a cost system for a retail lumber yard handling all kinds of building materials, and factory manufacturing sash, doors, mouldings, floorings, etc., also glazing and shipping department? There are about 60 men employed in all. Any information on the subject will be appreciated.

### OBTAINING AN APPRENTICESHIP WITH A CONTRACTOR.

From "E. A. L.," Chicago:

I would like to know how to obtain an apprenticeship with some contractor and

all about same. Will some kind reader of the NATIONAL BUILDER supply me with this information? I am twenty years old and have had a good architectural and technical education. My ambition is to become a general contractor. Do you advise me to serve as apprentice, or can anyone with architectural knowledge start in contracting without previous experience?

### HOW LIME BRICK IS MADE.

From "S. T. R.," New Jersey:

Will some reader kindly advise how lime brick is made? What proportions of lime, cement and sand are used? Is the lime slackened first and then tempered in sand? When the quantity of lime is mentioned, what is meant, dry or the putty?

From "C. M. McK.," Indiana:

I am going to build a house (stucco finish outside) and am trying to get reliable information as to which is the best lath to use, wood or metal. I am advised by good stucco men that wood lath will rot out in a short time and will dry the cement much quicker and cause it to crack more than

metal lath. I am also advised by a good Chicago builder that metal lath will rust in a short time and prove unreliable. He says use wood lath by all means. I would like to have someone's opinion on this subject. What are the probable reasons why a stucco man should be strongly in favor of metal lath and architects to be just as strong for wood lath?

#### BUILDING A PIT SILO.

From "G. V.," Kansas:

Will some one kindly give me some pointers on building a "Pit Silo?" Has it any advantages or disadvantages over an "Above Ground Silo?" Will it last as long or longer? How is the silage removed? Is there any danger from silage gas?

#### SQUARING THE TIMBER.

From "Northwest Carpenter," Moose Jaw, Sask.:

There are several ways of getting the section of square timber from a round log, and I had an argument with a fellow workman as to which is the best and most economical way to draw the sections on the end of the log so as to get the best results from the log. I would like to know how to do it, if some reader would oblige me.

#### ARCHES AND GROINS.

From "Bricksetter," Biloxi, Fla.:

I wish you would assist me in showing me how to make a shape center for arches and vaulting for a small church that is to be built of bricks, groins and all? I will feel obliged if some experienced reader will advise me on these points.

#### ROOF TILING.

From "Builder," Dover, N. Y.:

I am preparing to build a bungalow in the Adirondacks, and the owner wishes to make as much use of tile as possible on the roof and walls—I mean, of course, roofing tiles, the common brick or terra cotta tiles, and I do not know much about them and would like to get some information regarding the method of putting them in place, how to fasten them down, how to make the roof waterproof, and how to finish them off completely. Could you publish such in-

formation in this department? If you could, and do, I would feel much obliged for it. I have looked all over town for any books that would tell me something of this kind of work, but can not find any, not even in the library.

#### BOOKS ON SCAFFOLDING.

From "Contractor," Boston, Mass.:

Is there any good American work on scaffolding, gantries, or similar constructions, for sale in this country? I have wanted a book of this kind for some time, and although I have written to a number of publishing firms I have been unable to discover any such book. Perhaps you can give me some information on this subject. Perhaps this may come under the eye of some reader who has seen a work of this kind mentioned, and who will be kind enough to inform me through these columns where I can obtain a copy. Such information will be appreciated.

#### FARM WATER SUPPLY.

From J. A. S., Superior, Wis.:

I would like an idea on the best water system for a farm house—I mean for toilet and bath and hot and cold water; also what is the best power to use—wind or gasoline? What would it cost? Would like a cut of some farm house in which it is installed.

#### FLUE LININGS.

From R. J. M., Cincinnati, O.:

Can any of your readers tell me what causes natural gas fumes to crumble the inside of flues? Also if the fumes have the same action on flue linings (terra cotta) which some Cincinnati masons claim they have.

#### BACKING HIP AND VALLEY RAFTERS.

From "W. W.," Conn.:

Will some brother carpenter kindly inform me what is meant by the backing of a hip or valley rafter? What is the object of backing said rafters? Would some one also explain how to get the side cut of hip or valley to fit against ridge? Also how to get the side cut of jack rafter to fit against hip or valley rafters, and oblige a young carpenter.





## LEGAL DECISIONS OF INTEREST TO BUILDERS

*Prepared for the*  
**NATIONAL BUILDER**  
*by George H. Murdock*

Where a contract for the erection of a school building for defendant city provided that the city might, by order in writing, change the plans, that the contractor in such case should within one week deliver to the architect copies of such order, but that no sum should be allowed on account of any such order, unless a copy was so delivered or the mayor should approve the same, a contractor cannot recover for extras, where no written order was given and the mayor did not approve.—*Millen v. City of Boston*, 105 N. E. (Mass.) 453.

Where a building contract provided that, if there should be any claim which might be established by mechanic's lien "after all payments" were made by the owner, the contractor should refund to the owner all moneys which he was compelled to pay in discharging such claim, though the owner had a small balance due the contractor in his hands when he was served with notice of such a claim, he was entitled to recover from the contractor the amount paid by him in excess of such balance.—*Hiller v. Daman*, 166 S. W. (Mo.) 869.

The term "millwork," as used in building contracts and applied to window sash, includes ordinary glass properly set into

the sash and ready to be placed in position in the building.—*Foltmer v. First Methodist Episcopal Church of St. Cloud*, 148 N. W. (Minn.) 1077.

A change in the terms of a construction contract upon which plaintiff was surety will release plaintiff.—*Watterson v. Owens River Canal Company*, 143 P. (Cal.) 90.

Unless shown to be authorized, the agreement by officers of a corporation to changes in a construction contract will not change the contract, so as to discharge the contractor's surety.—*Watterson v. Owens River Canal Company*, 143 P. (Cal.) 90.

That a construction contract was void between the parties because not recorded in accordance with Code Civ. Proc. §1183, does not exonerate the contractor's surety from liability upon his bond.—*Watterson v. Owens River Canal Company*, 143 P. (Cal.) 90.

A surety upon a written construction contract is not discharged by verbal changes in the contract unless such changes are executed; Civ. Code, §1698, declaring that a contract in writing may be altered only by a written instrument or an executed oral agreement.—*Watterson v. Owens River Canal Company*, 143 P. (Cal.) 90.

## Book Notices

Notice—All books noticed in these columns may be obtained from this office at publishers' prices. All postage or express prepaid. (Money and address must accompany all orders.)

**CONCRETE PILE STANDARDS.** By Huntley Abbott, Associate Member American Society of Civil Engineers. Vice-President and Chief Engineer of the MacArthur Concrete Pile and Foundation Co.

This is really a timely work and "fills the bill" completely, also the wants of many architects, builders and contractors. This is a book of drawings, specifications and other data prepared for the assistance and

convenience of engineers, architects and designers who have to prepare specifications and plans for concrete pile foundations. It touches practically every step in the design of such foundations, and it is believed that much time and expense may be saved by the use of these standards. A part of the contents is given herewith:

1. Standard Details of Reinforced Concrete Pile Caps. Full explanation of their designs and large scale dimensioned drawings of all the standard and many special cases with estimated quantities and bills of materials.

2. Standard Specifications for all Types of Concrete Piles.

3. Concrete vs. Wooden Piles. A comparison of costs under various soil conditions.

4. The Theory of Pile Support, with actual values for friction and bearing quoted from recognized authorities.

5. Detailed description and drawings showing the Method of Testing a Concrete Pile.

The price of the book postpaid is only 50 cents, but is worth much more. It is published by the author, Huntley Abbott, C. E., 11 Pine Street, New York City.

**VITRUVIUS.** The Ten Books on Architecture. Translated by Morris H. Morgan, Ph. D., LL. D., late Professor of Classical Philology in Harvard University. Edited by Albert Andrew Howard, Ph. D., Pope Professor of Latin in Harvard University, with plans and illustrations by Herbert Langford Warren, A. M., Nelson Robinson, Jr., Professor of Architecture in Harvard University. Published by the Harvard University Press, 319 pages, bound in Library Buckram, \$3.50 net.

That the early architects had their troubles with clients, contractors and building departments, is evident from the works of Vitruvius. The excellent translation gives one an insight into their difficulties, as well as shows many of the theories of that day, some still theories, some confirmed by the advance in science and some entirely disproven and rejected.

Reading the books, written no one knows exactly when, and dedicated to a Caesar, whose exact identity is likewise uncertain, one feels that he would like to put the

author straight on a number of the evident errors. That being impossible, the books still give one an abundant field for thought as showing the architect's duties at that time.

The books of Vitruvius are practically the only books dealing with architecture which have come down to us from the early days, probably of the time of Augustus. The efforts of the author to render a faithful translation have succeeded admirably and the volume will rank with the classics which every architect should have in his library, both for guidance when considering early Roman architecture and for lighter reading when his time permits it.

The Harvard University Press is doing a good work in thus preserving the literature of architecture, and Vitruvius is the only author whose works should be perpetuated.

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**STRUCTURAL ENGINEERING.** By J. E. Kirkham, Professor of Structural Engineering, Iowa State College, Consulting Bridge Engineer, Iowa State Highway Commission. Published by the Myron C. Clark Publishing Co., Chicago. Price, \$5.00.

This is a broad subject, and the author has endeavored to cover the elements thoroughly as well as to give the reader excellent theory and practice. The book is intended for a text-book for college students as well as for a self-explanatory manual for practical men.

The use of a book of this character in the schoolroom makes it something of a reference book to supplement the classroom work as well as to provide suitable drawing problems both for the class and drawing room as well as for home study.

The subjects are taken up in a practical manner, as would be expected from one having had many years of actual experience, and the drawings are practically what would be found on any project involving structural work. Bridges, trusses, skyscrapers, plate girders, etc., all are shown and described.

The student will find this an excellent aid to him and the contractor cannot fail to get much light on how the engineer does his work, and he will thus be in a position to work in harmony with the engineering trades.



# Building Material Price List

Revised to Date

\*Price not given. yp—Yellow pine. wp—White pine. np—Norway pine. op—Oregon pine.  
 rw—Redwood. s—Spruce. oc—Ontario cedar. h—Hemlock. bc—British Columbia cedar. rc—Red  
 cedar. F—Fir. cdr—Common cedar. cyp—Cypress. bm—Board measure. sis—Sized one side.  
 d4s—Dressed four sides. kd—Kiln dried. rg—Rough. c—Clears.

Dimensions—	Seattle, Wash., Corrected by F. T. Bradley,	Chicago, Corrected by J. H. Touchstone, M ft. BM S2S	Omaha, Nebr., Corrected by I. P. Hicks, M ft. BM S2S	Southern Ontario, Corrected by F. O. Frantz, M ft. BM S2S
	M ft. BM	S2S	M ft. BM	M ft. BM
2x4 in. to 8 in. up to 16 ft., No. 1.....	\$10.00	\$20.00	yp \$27.00	h \$27.00
2x4 in. to 8 in. up to 16 ft., No. 2.....	9.00	17.00	25.00	22.00
2x4 in. to 8 in., 18 and 20 ft., No. 1.....	10.00	22.00	28.00	30.00
2x10 in. up to 16 ft., No. 1.....	11.00	21.00	30.00	24.00
2x12 in. up to 16 ft., No. 1.....	11.00	22.00	32.00	25.00
2x14 in. up to 16 ft., No. 1.....	12.50	23.00	*	26.00
Each 2 ft. over 20 ft., add per M.....		1.00	1.00	2.00
Select stock as above, add per M.....	4.00	5.00		*
Exterior Finish, Etc.—				
1x3 in. to 1x8 in., No. 1.....	27.00	M ft. BM D4S	M ft. BM D4S	M ft. BM D4S
1x16 in., No. 1.....	39.00	yp \$30.00	yp \$45.00	wp \$40.00
1x12 in., No. 1.....	30.00	40.00	43.00	40.00
1½x3 in. to 1½x12 in., No. 1.....	33.00	35.00	46.00	42.00
1½ in. and 2 in., same as above.....	33.00	45.00	48.00	45.00
1-in. drop siding, No. 1.....	25.00	45.00	48.00	42.00
½-in. lap siding, No. 1 cedar.....	25.00	25.00	30.00	30.00
		24.00	rdw 30.00	30.00
Enclosing and Fence Boards—				
1x4 in. to 1x8 in., No. 1.....	11.00	M ft. BM S1S	M ft. BM S1S	M ft. BM S1S
1x8 in. to 1x12 in., No. 1.....	11.00	yp \$24.00	yp \$25.00	wp \$30.00
1x16 in., No. 1.....	15.00	26.00	24.00	h 24.00
1x16 in., No. 2.....	13.00	*	24.00	24.00
		*	22.00	22.00
Interior Finish, Flooring, Ceiling, Etc.—				
1x6 in. T. & G. Flooring, No. 1.....	25.00	M ft. BM DS	M ft. BM D4S	M ft. BM D4S
1x6 in. T. & G. Flooring, No. 2.....	22.00	yp \$24.00	yp \$38.00	wp \$40.00
Ceiling, per M.....	20.00	20.00	34.00	wp 30.00
Partition, per M.....	30.00	21.00	22.00	21.00
¾x4-in. Ceiling, No. 1.....	22.00	32.00	32.00	32.00
		22.00	30.00	np 30.00
4¼-in., Moulded Casing.....	\$2.00	100 ft. run	100 ft. run	100 ft. run
4¾-in. Moulded Casing.....	2.50	yp \$1.75	yp \$2.00	wp \$2.50
7¼-in. Moulded Base.....	3.00	2.00	2.50	2.50
½x9¼-in. Moulded Base.....	4.00	3.00	3.50	5.00
1½x4½-in. Moulded Window Stool.....	2.50	4.00	4.00	6.00
		2.50	3.00	4.00
Miscellaneous List—				
Shingles, No. 1.....	2.75	rc \$3.50	Per M	Per M
Shingles, No. 2.....	2.25	3.00	\$4.00	bc rc 4.00
Shingles, Fancy.....	3.50	*	3.75	*
Lath, 4 ft., No. 1.....	2.25	3.60	4.50	6.00
Lath, 4 ft., No. 2.....	1.50	2.75	yp 5.50	wp 5.00
Pickets, 1x3 in. x 4 ft. 6 in., dressed.....	30.00	35.00	5.00	s 3.75
Pickets, 1x3 in. x 4 ft. 6 in., rough.....	20.00	*	30.00	*
		Piece	*	*
6 in. x 8 ft. Post, split.....		cdr \$0.13	Piece	Piece
8 in. x 8 ft. Post, split.....		.17	\$0.25	*
8 in. x 8 ft. Post, whole.....		.66	.30	*
6 in. x 8 ft. Post, whole.....		.25	.40	Cdr \$0.30
			.35	.25
Hardware List—				
Nails, wire, common.....	\$2.25	Cwt.	Cwt.	Cwt.
Nails, cut, common.....	2.10	\$3.00	\$2.85	
Nails, wire, fine finishing.....	2.65	*	3.00	
Sash Weights, cast iron.....	1.60	3.50	4.00	
Tarred Felt Paper, best 2-ply.....	Roll \$1.00	1.50	2.25	
Tarred Felt Paper, 3-ply.....		Roll \$1.00	Roll \$1.25	
Red Rosin, Atlas brand.....		1.25	1.50	
Red Rosin, durable brand.....		.90	1.00	
Black Neponset.....		.75	1.00	
		*	2.00	
Masons' Supplies—				
Brick, blue, at kilns.....		Per M	Per M	Per M
Brick, blue, at kilns, No. 1.....		*	*	*
Brick, blue, at kilns, No. 2.....		*	*	*
Brick, white, delivered, face.....	\$7.50	*	*	*
Brick, red, delivered, backing.....	7.00	*	*	*
Brick, delivered, dry pressed.....	7.00	\$7.50	*	*
Brick, vitrified, dry pressed.....	18.00	18.00	17.00	
Lime, best gray.....	*	24.00	*	*
Lime, best white.....	bbl. \$1.30	bbl. \$1.25	bbl. *	*
Cement, Portland.....	1.40	1.25	*	*
Plaster, calcined.....	.95	1.85	bbl. 1.70	
Hair, 8 lb. per bush.....	2.40	1.80	bbl. 2.50	
	.25	.25	*	*

NOTE—While these figures are approximately correct at the time of preparing, the continual fluctuations and shifting of prices make it necessary to advise our readers to consult local price lists when making up tenders.—Ed.

# To Contractors *In the East and Middle West*

Gentlemen:

If you want millwork, glass and paint at wholesale prices, extremely prompt service and quality suitable for the best of work, write us your wants.

We have the largest sash and door mill in Ohio and we believe it the largest in the country—which is devoted exclusively to contractors' trade.

Of greater importance, we carry much of the material partly made up, enabling us to supply most odd work in a fraction of the usual time.

Our specialty is **QUICK SERVICE ON MILLWORK**. Every order has a close and personal follow-up.

In our warehouses we have seventy-five carloads of millwork, glass and paint always in stock. In our yards and sheds are over a million feet of shop lumber, largely cut stock, and door, sash, frame and finish material in the knock down. Over three hundred people are on our pay roll.

Our terms and dealings are liberal. We give on millwork 5% for cash with order, or on approved credit give 2% cash in 10 days or 30 days net. On C O D orders we ask 20% down and give 2% cash discount.

We have only one business—supplying millwork, paints and glass to builders, and we give this business our entire attention.

Try us on a sample order, large or small, and see if it is not very much to your interest to buy of us.

Yours very truly



**The Cleveland Window Glass & Door Co**  
**CLEVELAND OHIO**

*Write for Catalog; Sash and Door, Paint, Art Glass or Mantels*



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ON LETTERS YOU  
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# Our Advertisers' Symposium

No part of the contractor's work requires more general knowledge than how to provide and leave space for, build in and get ready for operation, the many accessories and manufactured articles and pieces of equipment found in the home, on the farm, in the mercantile or the factory building.

The contractor must consider this equipment in making up his bid and according as he knows how each piece operates, is he successful in first making an intelligent

bid; second, doing a workmanlike job; third, satisfying the owner that the work is done right.

A number of our advertisers make goods of the above character. They have catalogs and circulars describing the various appliances and fittings, but they are also taking advantage of an opportunity to speak to each one of you. Their messages are personal and you will be well repaid for giving them careful attention.

## **Willis Mfg. Co.** Galesburg, Ill.

Contractors who are experiencing trouble in securing skylights which are not perfectly satisfactory should write to us for our Catalog No. 6, which describes a full line of sheet metal building material, and gives in detail descriptions of our well-known "Willis Skylights," which are made in all the different styles. Each skylight is guaranteed perfect as to workmanship and material and are guaranteed not to leak. All our skylights are shipped K. D., which means a saving in freight expense. Any mechanic of ordinary ability can erect the same without the use of tools other than a screw driver and hammer.

Besides the "Willis Skylights," we also manufacture all styles of fireproof metal window frames and sash under the supervision of the Underwriters' Laboratories and attach their label.

Contractors and builders should send for our catalog and file it for future references, as there is scarcely a plan which does

not call for some product in which reliable prices are given in this catalog.

**WILLIS MANUFACTURING Co.**

## **J. W. Coulson & Co.** 95 W. Spring St.

**COULSON PATENT STORE FRONT  
CONSTRUCTION.**

Many merchants at this season of the year will remodel their store fronts and the contractors who do this class of work are anxious to become posted on the best patent store front construction, for the old style wooden fronts have passed out of existence and nothing but modern fronts with metal construction will be considered.

We are glad of this opportunity to tell a few facts about our product. It makes an attractive, substantial and durable store front and does not cause glass breakage, for it furnishes a safe and practical setting for the glass with no uneven pressure at any point. As it is gotten out complete in our factory, it is easily installed.

The ventilating and drainage sill is wood with metal covering, in one piece, formed so there is a gutter on the inside which catches all moisture in washing the windows or caused by condensation and carries it out through metal tubes brazed into it. These not only act as drainage pipes, but as ventilating openings. The gutter is provided with stops, making it absolutely water tight so no moisture will penetrate the woodwork below. In this way there is no possibility of there being any occasion to replace any of the woodwork on which the glass sets.

The transom bars are furnished complete

## **Screw Holes That Hold**

Don't put screws in wood—the thread in the hole wears out and the hole has to be plugged.

Use Stine Screw Holes, made of brass, driven into the wood. Will hold the screws tight everlastingly.

Furnished in all sizes for all kinds of work—wood, glass, marble, plaster of paris, stucco, cement and all kinds of metals.

Samples free to architects, contractors and dealers. Write today.

**STINE SCREW HOLES COMPANY**  
Corner Main and North Decatur, Ill.



# Our Service Bureau Helps 10,000 Contractors Make Money FREE To You

**A**LTHOUGH we are today serving an army of nearly 20,000 contractors, carpenters and builders, we realize that we are only touching the surface. For example, do you, yourself, understand our one-price, low-cost, high-quality methods of doing business? Are you familiar with our "Guaranteed Right" plan of prompt estimating? Do you know we employ a staff of high class architects to develop and work out your own ideas? Do you know you can have us do this for you cheaper and better than your local architect? Have you understood that our Service Department is at your Free Disposal? Do you know the "Factory Price Plan" which has created our enormous business? Ask yourself these questions. If you do not know the complete answer to every single one of them, write to us and let us answer them for you.

**All Our Estimates Are "Guaranteed Right"**  
*Let Our Service Save You Thousands of Dollars*

**O**NE builder wrote us recently that in 14 months we had saved him \$3,000 on a total of \$10,000 worth of building material. That is a 30% saving. But, mark you, he had his regular profit as well. So this \$3,000 extra profit was virtually an additional bonus over and above regular profits! It is worth your while to save \$3,000 on every \$10,000 of material you buy. You can do it, too. Our Service Bureau will show you how; that's what we have it to do. Write for details and "Guaranteed Right" estimate on your needs.

**Make the Coupon Bring You Our Building Material Catalog**

**T**HIS splendid 156-page profusely illustrated catalog containing over 5,000 bargains in high grade Building Material is a veritable encyclopedia of Building Information for contractors and carpenters and a price-maker for the entire building trade. We will send you a copy FREE on request.

a test order is all we ask. Our catalog prices speak for themselves and a test order will convince you the quality and shipping service are back of them.

We ship direct to you anywhere you live.

Satisfaction or Money Back—three strong banks and 100,000 satisfied customers endorse this.

If you have never dealt with us

**USE THE COUPON**

## **GORDON-VAN TINE COMPANY**

**750 Case St., Davenport, Iowa**



**FREE  
COUPON**

**GORDON-VAN TINE CO.,  
750 Case Street, Davenport, Iowa**

Gentlemen—Please send the books checked below,

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> <b>Building Material</b> | Lumber, Millwork,<br>Hardware, Paints, etc. | <input type="checkbox"/> <b>Plan Book</b> |
| <input type="checkbox"/> <b>Roofing</b>           | Circular<br>and Samples                     | <input type="checkbox"/> <b>Lumber</b>    |

Name .....

Address .....

Occupation .....

In sending for Plan Book, enclose 10 cents for postage and mailing. You will receive the books by return mail.

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**ON LETTERS YOU  
TISERS. IT HELPS.**



with wood—creosoted to prevent decay—reinforced with steel T's having lugs at either end by which they are secured with screws to the jamb casings and door posts, and where they intersect are bolted to the steel T's in the corner posts and division bars—making a steel framework. The entire outer surface is covered with 18 gauge brass or copper. Supports on the transom bars are provided for canopy ceiling.

Our awning hood is of metal with metal brackets, requiring no woodwork.

Awning lugs to which to secure awning fixtures are provided on our corner posts and division bars. Corner posts and division bars are of various sizes and shapes, reinforced with steel T's and provided with lugs to which they are secured to the base below and lintel casing or transom bar above.

Ventilating and metal covered stops complete the system.

We also furnish drawn metal coverings for base and jamb and lintel casings; kick plates and extruded solid brass thresholds.

An investigation of our construction will convince you that our system is the best.

Let us assist you by preparing your drawings for store fronts with all full size details worked out.

J. W. COULSON & COMPANY.

### **National Sheet Metal Roofing Co.**

339-345 Grand St., Jersey City, N. J.

Attention is called to the Walter's and Cooper's metal shingles, manufactured by the National Sheet Metal Roofing Company of Jersey City, N. J., as possessing many desirable qualities for the roofing of country buildings, barns, and etc. Metal shingles make the most durable manner of applying metal for roofing purposes, as they possess ample provision for contraction and expansion of the metal. No soldering or hammering down of joints is required, and there is no nail heads exposed. The manner of locking the shingles together is so simple that they can be easily applied by anyone having had previous experience in laying of wood shingles, slate, or other roofing. Their durability is substantiated by the long years of service given by metal shingle roofs, there being many of these roofs that have given service for twenty-five years without painting or repairing.

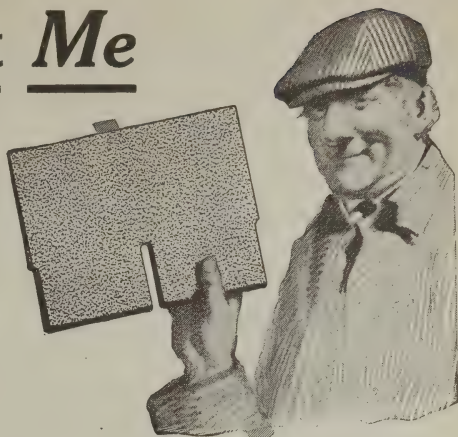
In comparison with slate or wood shingles, metal shingles are much lighter, consequently they do not require as heavy and expensive roof framing as would be required by other roofing material. While lighter in weight than these other forms of roofing, the material used in their manufacture is amply heavy for the requirements. The genuine redipped galvanized tin shingles are the most durable shingles in quality that are manufactured. These shingles are stamped from sheets of perfect roofing tin, and after all stamping and embossing is completed, the shingles are galvanized by the old style process. This process consists of dipping the shingles by hand, one at a time, in open kettles of molten zinc. The base sheet that is galvanized carries an exceptionally heavy coating of zinc, and there are no cracks or abrasions in forming the shingles. The genuine redipped galvanized tin shingles are guaranteed rustproof without the protection of paint. These shingles are also made in painted tin. The durability of the painted tin shingles depends somewhat on the paint that is used to protect the shingles. If a good quality of metallic paint is used, and a coat of paint given every three years, these goods will last practically as long as the galvanized. A metal shingle roof is fireproof, and will make an absolutely storm, weather and wearproof roof, and by reason of the many ornamental designs in which these shingles are offered, they will add much to the appearance of the building which is covered with them.

In recovering old roofs covered with wood shingles, we advise that the fourteen by twenty size of metal shingles be laid on over the old wood shingles, without tearing the old shingles off. The annoyance of the dirt and muss in removing the old wood shingle roof is avoided, and you are also protected against any storm damage that might result while the work is in progress. There are many thousands of old wood shingle roofs covered over in this manner that have given splendid satisfaction. Catalog, samples and prices of these goods will be gladly furnished by the National Sheet Metal Roofing Company, Jersey City, N. J.

# "This Shingle Put Me on the Map"

The first NEPONSET Shingles put on, down my way, were put on by Yours Truly.

Naturally I got the next job — and the next job — and the next job. Any other carpenter could have done it just as well but the NEPONSET shingled roofs were advertising



*me* all the time and so one job just followed the other. I have covered 15 roofs and still going strong. I use

## Neponset Shingles

PATENTED

because I *know* they are durable and fire resisting and *anyone* can see they are architecturally perfect. Don't think they are stamped out of ready roofing. This is not so. They are built up specially — heavy butt end and all that.

I'm a NEPONSET Shingle enthusiast.

This shingle put *me* on the map!

The same materials are used in NEPONSET Shingles as in the well known **PAROID ROOFING**; also used in NEPONSET Proslate, the highest grade colored ready roofing ever made.

NEPONSET Wall Board, NEPONSET Waterproof Building Paper and NEPONSET Floor covering are other well known NEPONSET Products.

**Bird & Son, Dept. N, East Walpole, Mass.**

Please send me a sample of the NEPONSET Shingle. This does not obligate me in any way whatever. Also send copy of your booklet "Repairing and Building."



Name \_\_\_\_\_

Address \_\_\_\_\_

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ON LETTERS YOU  
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## The Union Metal Manufacturing Co.

Canton, Ohio.

We take pleasure in outlining ten reasons why it is desirable to install Union Metal Columns, "The Ones That Last a Lifetime":

1. They are architecturally correct.
2. They have entasis and stopped flutes.
3. They are clean cut, highly ornamental and stately in appearance.
4. They are the strongest porch columns manufactured today.
5. They are made from the best grade of open hearth galvanized steel. They are fluted and tapered by our patented process.
6. They are infinitely better than wood columns because they will not split, check, rot, warp, or open up at the joints. They are the modern column.
7. They are not experimental, but are used in thousands of structures in the United States and abroad—from the modest cottage to the most elaborate mansions and public buildings.
8. They are indestructible and last a lifetime. They are suitable for all climates and temperatures.
9. They are by far the most practical, durable, handsome, reasonable priced column on the market.
10. An installation of Union Metal Columns is not an expense. It is an investment. "The first cost is the only cost."

Union Metal Columns are absolutely true to the different orders of architecture—Corinthian, Ionic, Doric, etc., and are made in all diameters from 8" to 40", and in all heights from 5' to 35'.

We have just printed a handsome forty-page "Installation Book," showing Union Metal Columns applied to all types of buildings in every part of the country.

We should be pleased to send this comprehensive publication to any readers who are interested.

THE UNION METAL MFG. CO.,  
C. L. Eshleman, General Sales Manager.

**F. E. Myers & Bro.**  
Ashland, Ohio.

MYERS DOOR HANGERS.

The modern builder is paying more attention to the hardware fixtures that go on

his buildings than ever before. A streak of rust will no longer answer for a door hanger *track*, and a *door hanger* that will not stay on the track or cannot be adjusted to meet varying conditions has long since been abandoned to the scrap heap.

The original Myers O. K. Stay-On Door Hanger and Track revolutionized the door hanger business in that they were made, as the name implies, to stay on the track. Everyone having had experience with the old style hangers jumping off the track at the least provocation, will appreciate what we mean. Moreover, this hanger was made with a covering to protect it from sleet and snow and with flexible joints which permit the door to swing in and out.

From this hanger there was quickly developed the Myers Adjustable Stay-On Hanger, which, keeping the stay-on as well as the covered and flexible features, also added both perpendicular and lateral adjustments. By these two adjustments, doors can, with the aid of an ordinary monkey wrench, be raised and lowered and thrown to and from the building at will. This prevents them from dragging on the ground when the same is heaved up by frost and also permitting them to cling close to the building and passing any uneven surfaces.

Later requirements brought out the Myers New Way and Giant Door Hangers, and both of the hangers have the flexible joint features, the perpendicular and lateral adjustment and run inside a tubular girder track, thus keeping the stay-on feature and being protected from all weather conditions. They are similar in everything but size—the New Way Hanger being used with smaller track and particularly adapted for the smaller doors, thus effecting a saving to the builder who is not required to buy the larger and more expensive hangers and track for all of his doors. These door hangers are made with hard turned steel trolley wheels, revolving on steel roller bearings and push and pull easy.

The Myers Tubular Girder Track used with New Way and Giant Hangers is made of heavy high carbon steel and was formed or shaped so as to give a good bearing surface for the trolleys and at the same time produce a stiffening girder by means of downward extending lips, making the track exceptionally stiff and permitting of vari-

## Millwork and LUMBER that HELP any Contractor.

Mail us **LISTS** for Estimates

### Gypsum Wall Board

The **ONLY** Board with  
a **MINERAL** Core

### Sideboards Oak Flooring Maple Flooring

Ask for "Flyer" of these  
goods. It is **FREE** to  
Contractors who write  
on their letterhead or en-  
close business card.

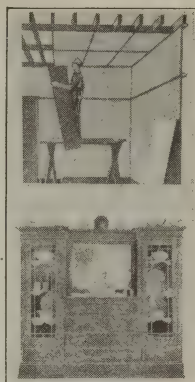
## Get Our **FREE** **ESTIMATES**

on Lumber and Millwork for all jobs. Mail  
**LISTS** for Free Estimates. We help you figure  
safe—make more—build better.

**BARROWS &  
DONNELLAN Co.**

8743 Baltimore Ave.

CHICAGO



# This job showed a \$22 Profit



**T**HE contractor was able to  
do the job in stormy weather  
because he used **Utility-Board**. You,  
too, can make similar profits when business  
is slack or weather unfavorable. Every town  
has a job like this to be done.

## UTILITY-BOARD —the preferred wall-board

**Utility-Board** is a special composition fibre  
board—built up of layers lastingly welded together  
with hot asphalt under tons of pressure into stiff,  
moisture-proof sheets of convenient size.

**Utility-Board** nails direct to studding and  
joists or it can be applied over old plaster or ceiling  
without removing plaster or ceiling from the walls.

### Special Offer to the Building Trade Only

We have had struck off a number of enlarged  
reproductions (size 5x6") of the attic room shown  
above. While they last we will send them, together  
with liberal samples of **Utility-Board** to any car-  
penter, builder or contractor who writes us.

Every attic should be lined—it makes the top  
of the house cooler in summer and warmer in win-  
ter—shuts out the dust and dirt—puts the attic in  
shape to be lived in. You probably know of several  
families in your town who could use an extra room  
in their attic to advantage. Drop postal today for  
one of these pictures and use it to show them what  
can be done with **Utility-Board** at very small cost.  
They will want one of these rooms when they  
see the picture.

**THE HEPPES COMPANY**  
Manufacturers also of **Flex-A-Tile Asphalt Shin-  
gles, Asphalt Paint and Asphalt Roofing in  
Any Finish**

4502 Fillmore St., Chicago, Ill.

## NICKERSON COLUMNS...

are preferred by those ar-  
chitects, contractors and  
owners who know  
most about column  
construction, be-  
cause:

**Of their style, propor-  
tions and durability.**

**The Double Lock Joint  
Construction insures  
quality.**

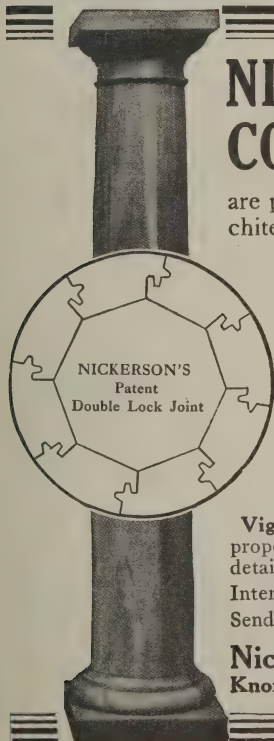
**Workmanship  
Guaranteed.**

"**Vignola**" is our standard for  
proportions when architect's  
details are not furnished.

Interior Trim to detail.

Send for Catalog No. 4.

**Nickerson Mfg. Co.**  
Knoxville : : Tennessee



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WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



ous substances to empty out rather than gather upon the bearing surface. The track is supported by means of heavy intermediate brackets and end brackets, which are enclosed to prevent birds from building their nests in the track.

During the last year there has been a demand for covered track which would fit up close to the building and cover both the track and the top of the door. The Myers Hercules Covered Track meets this requirement. It consists of the Giant Door Hanger Track and metal covering made and riveted together in such a way that the Giant track when used alone fits into the Hercules Track and can be used with it. This is a decided advantage, as it affords a big saving to the user. There is really no need to protect the entire length of the track from rain and snow. Only that portion of the track that is over the doorway and from which the doors are hanging when closed need be protected. Thus by using the Hercules Covered Track over the doorway and the Giant Track which fits into the Hercules for that portion to be used when the doors are open only, the doors are perfectly protected from water and the builder is money in pocket.

### Enterprise Iron Works

Albert Lea, Minn.

Not every innovation in building that has come up in recent years has made a place and a necessity—like the fuel chute—which has come to stay. The time was when the coal man came, coaling up—along with his shovel he brought a hammer and a pry—to get an opening through which to throw the coal, a breaking, battering and disfiguring operation—to the dismay of the landlord or careful housewife.

Now no thoughtful builder of home, office or business building, school or opera house, consider a building complete without a fuel chute, especially so when the cost is trifling—and one or two seasons' repairs on a window and frame the old way will pay for it. The Enterprise Chute is neat, substantial and an ornament to any building. Is the easiest installed of any chute made—so simple that any child can operate them—all outside the coal bin—either to lock or unlock.

The roller hinges in the Enterprise Chute is one of the features; no bolts to rust and

stick or to be removed to effect an entrance from the outside. Lock is positive—operates by gravity, and can be locked only from the basement outside the coal bin, and in no other way. They are a chute that the customer and builder alike are perfectly satisfied with.

### Western Electric Co.

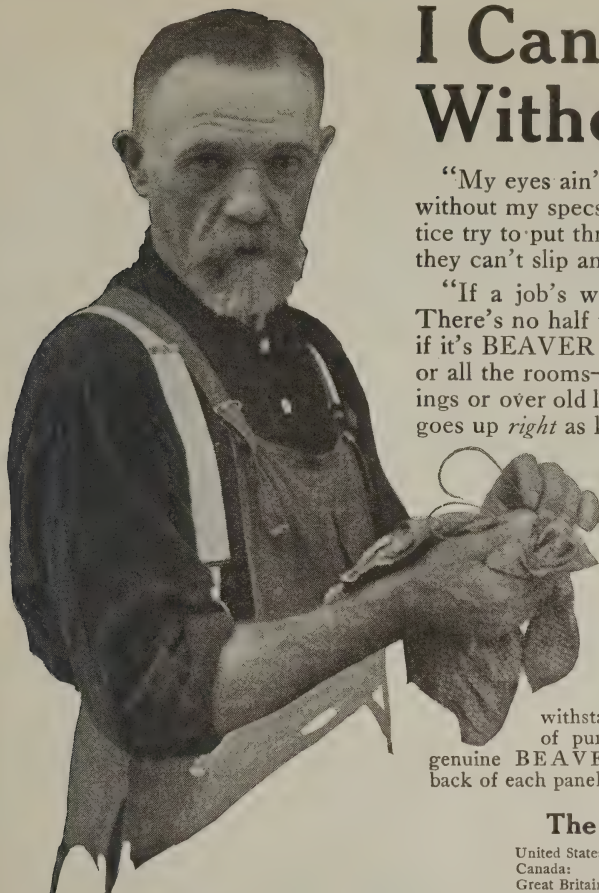
INTERCOMMUNICATING TELEPHONES IN HOMES.

A home, to be attractive to a prospective tenant or purchaser, must be equipped with things that will make for the comfort and convenience of those who are to live in it. One reason for the popularity of apartments with housewives is the fact that there are no stairs to climb and everything is on one floor. This objection to a house of two stories or more can be easily overcome if the house is furnished with a means for eliminating unnecessary stair climbing, thus relieving both mistress and maid of one of the most annoying and wearing incidents of housework.

The elimination of stair climbing can be brought about by the use of intercommunicating telephones. A comprehensive line of these, covering a system for every service requirement, is manufactured by the Western Electric Company under the trade name of "Inter-phones." Inter-phones are available for use in any size residence, in the one requiring but two stations or in the one requiring from three to twenty-four.

The operation of an Inter-phone system is exceedingly simple. To call, it is only necessary to take the receiver from the hook and press a button in the face of the Inter-phone, thus ringing the bell at the station wanted. The person at the called station has only to take the receiver from the hook to establish a talking connection. In none of the systems are the services of an operator necessary.

For a small suburban or country residence where only two Inter-phones are needed, one in the bedroom and another in the kitchen or garage, a standard package outfit has been arranged that contains the Inter-phones and all necessary wiring material, together with illustrated directions for installing. This outfit costs little to buy, practically nothing to install, and adds



# I Can See It Without My Specs

"My eyes ain't any too good but I can see a bad job without my specs. I've seen many a fresh young apprentice try to put through a job slap-dash, any old way. But they can't slip anything over on the old man.

"If a job's worth doing at all, it's worth doing well. There's no half way about it. Don't make any difference if it's BEAVER BOARD walls and ceilings in one room or all the rooms—in big houses or small—in new buildings or over old lath and plaster—the BEAVER BOARD goes up *right* as long as I'm on the job. I took just as much pains with the attic I finished off for a spare room as I would with any fine living room.

"Take my advice and get started right on BEAVER BOARD. The Builder's Service Department gave me all the pointers. They'll do the same for you."

You can't expect other wall-boards to give the same satisfaction to the customer as BEAVER BOARD. It's sized on both sides to prevent absorption of moisture and withstand changes in climate or temperature. It's made of pure-wood-fibre—long, tough, durable. Identify genuine BEAVER BOARD by the trade-mark stamped on back of each panel.

## The Beaver Board Companies

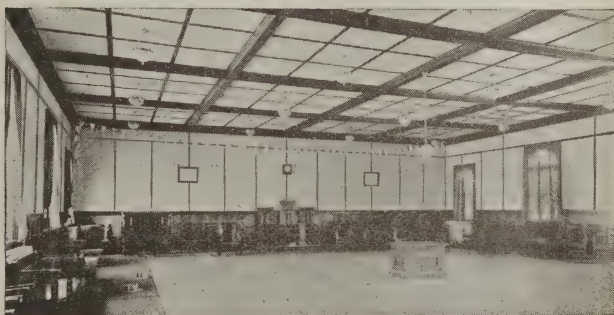
United States:  
Canada:  
Great Britain:

661 Beaver Road, Buffalo, New York  
861 Wall Street, Beverdale, Ottawa  
4 Southampton Row, London, W. C.

*Branch Offices in Baltimore, Boston, Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Mo., Minneapolis, New York City, Omaha, Philadelphia, San Francisco.*

**A cordial invitation is extended to builders, contractors and carpenters to visit any of the above offices**

BEAVER BOARD ceiling in the Elk's Lodge Room, Rocky Ford, Col. A big job—well done.



Send for free sample and book of special interest to carpenters.

# BEAVER BOARD

## WALLS & CEILINGS

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



greatly to the value of the house. There are no moving parts in any of these Inter-phones to get out of order and therefore no expense for upkeep other than infrequent renewals of batteries, which brings the maintenance cost down to that of the ordinary door bell.

If a larger house is being built for a definite purchaser who at the time of building does not wish to invest in Inter-phones, but wishes only a call bell and annunciator system, the way can be paved for a future sale and installation of Inter-phones. This can be done without running a single extra wire.

Instead of the push buttons ordinarily used in connection with bell wiring, Inter-phone push button plates can be installed, costing only a bit more than the others. With these in place, Inter-phones can be added at any time by simply inserting a plug.

Inter-phones are made in three different styles—wall, desk set and hand set types, the choice of a type depending upon individual taste. They are well made, practical talking telephones, made by the same company that manufactures the 8,000,000 Bell telephones.

---

#### **Drew Carrier Co.**

117 Monroe St., Waterloo, Wis.

QUALITY WILL TELL.

There are several features connected with the Drew Barn Equipment that should give the builder of a barn considerable pause.

The big one is that this equipment was worked out to be fundamentally right for the user—mark the fact that we say “Fundamentally” right—and as a consequence it cannot help being “right” for the builder.

For one thing, Drew Barn Equipment is designed on the “sectional” idea—it is always complete but it is never finished. It can be added to at any time without the slightest inconvenience—without disturbing, in the least, the portion that has already been installed.

Such a feature as this adds greatly to the prestige of the builder, in the mind of the owner, and cannot but result in a greatly enhanced reputation for foresight and thoroughness. And this, we all know, is an asset that cannot be valued in dollars because it cannot be bought with money.

Another feature for the builder to consider very seriously is the manner in which Drew Barn Equipment stands up—makes good on the job. Because of this inherent quality each job is working for the builder long after he has, very probably, forgotten about it.

Back there a few paragraphs we mentioned the fact that Drew Barn Equipment was made fundamentally right with the user's requirements in mind—and that's true—but that which the builder is most interested in is the ease with which such equipment can be installed. Now, as a matter of fact, making the equipment right for the user made it right for the builder. The whole thing resolves itself into a matter of simplicity. The simple equipment is best for the user—naturally it is the easiest for the builder to install. It is just another angle of the thorough “working out” of the Drew principle. You can't beat it. Extra contraptions and furbelows may sound all right by which to influence “snap” sales—but they don't pan out—they don't stand up and make good.

It is this principle of utter simplicity reduced to the last analysis that has made the Drew Stanchion, and Stall, and Manger, and Litter Carrier—and everything else—the standard of excellence.

---

#### **The Edwards Manufacturing Co.**

430-450 Eggleston Ave., Cincinnati, O.

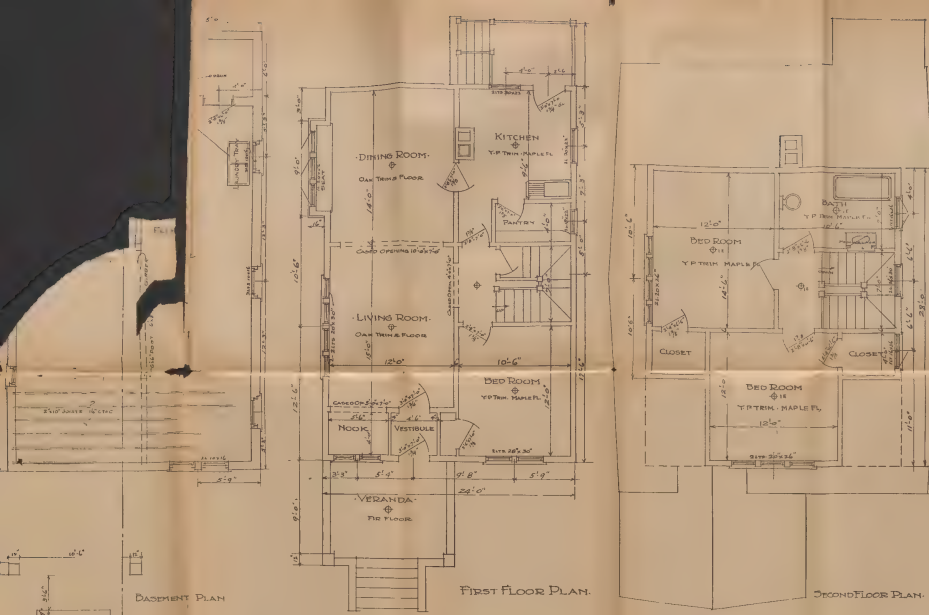
SELECTING METAL CEILINGS.

Too great a care cannot be taken by the contractor and owner when specifying a metal ceiling for the building they are erecting. In this connection I find that one-half of the churches, theatres and public buildings are being covered with plaster. Why? Because the party who erected a metal ceiling in a church building recently failed to state, when sending in his order, that the material was to be used in a building of this kind.

As the work was being rushed he simply sent in the order to the factory, explaining that he only had a limited time to complete his contract and needed ceiling to cover a room 40x60. Naturally the manufacturer did not have time to correspond about the designs or arrangements, etc., and if they did probably the order would have been lost, so, under the circumstances, made up, to the best of their ability, sufficient amount

[illegible]





# SUPPLEMENT TO THE NATIONAL BUILDER

NATIONAL BUILDER DESIGN No. 384; A STUCCO COTTAGE

Scale for floor plans and elevations, 1 inch equals 4 feet.

FOR DESCRIPTION AND ESTIMATE SEE PAGE 35

This Cottage is Shown in Colors on Front Cover

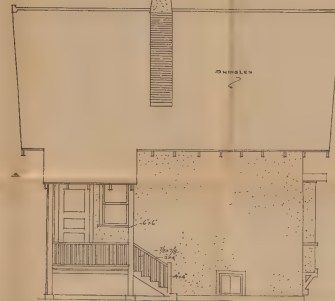
Detail of Hollow Wall  
Metal Lath on Wood Studs  
Detail No. 7



LEFT SIDE ELEVATION.



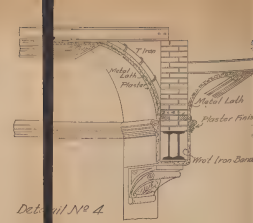
RIGHT SIDE ELEVATION.



REAR ELEVATION.



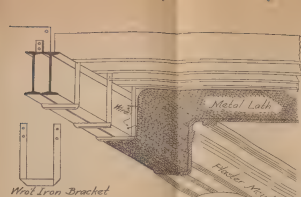
FRONT ELEVATION



Detail No. 4.  
Metal Lath for Curved Ceilings and Domes



Elevation of C/P



Wood Iron Bracket

Drawing No. 7.  
Showing method of applying  
metal lath to steel girders  
and round columns.

Cast Iron Column.



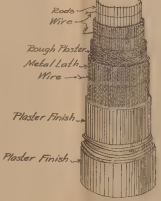
Detail No. 8.  
Metal Lath  
Plaster  
Gypsum or Acetylene  
Generator and Storage House.  
Scale: 1/4" = 1'-0"



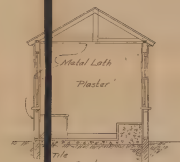
Detail No. 9.  
Column Protection  
Scale: 1/4" = 1'-0"



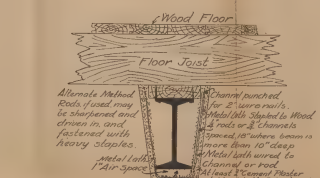
Drawing No. 10.  
Red Proof, Bird Proof  
Thief Proof, Corn Crib.  
Scale: 1/4" = 1'-0"



Detail No. 11.  
Metal Lath  
Plaster  
Wire



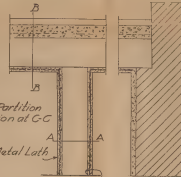
Drawing No. 12.  
Fireproof Factory Oil House  
Scale: 1/4" = 1'-0"



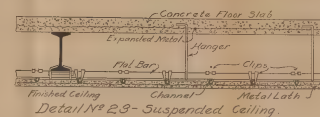
Detail No. 13.  
Metal Lath  
Plaster  
Wood Floor  
Floor Joist



Detail No. 14.  
Metal Lath  
Plaster  
Sleeper



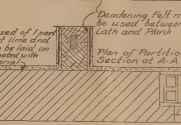
Detail No. 15.  
Metal Lath  
Plaster  
Elevation of Partition  
and Floor Section at C-C



Detail No. 16.  
Metal Lath  
Plaster  
Concrete Floor Slab  
Expanded Metal  
Hanger  
Clips  
Metal Lath  
Channel  
Suspended Ceiling



Detail No. 17.  
Metal Lath  
Plaster  
Plan of Partition  
Section at A-A



Detail No. 18.  
Metal Lath  
Plaster  
Typical Detail for Mill-Constructed Building in which  
Wood is Protected by Metal Lath and Plaster.

# SUPPLEMENT TO THE NATIONAL BUILDER

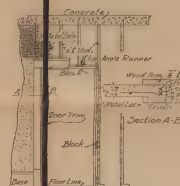
APRIL, 1913

## CONSTRUCTION DETAILS

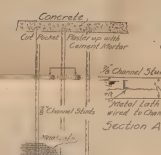
SHOWING

The Use of Metal Lath for a Great Variety of Purposes in connection with other materials and forms of construction as well as for large and small buildings.

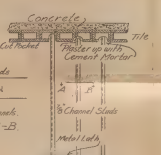
For explanations, specifications, etc. of these drawings see pages 35, 36, 37, 38, and 39 of this issue.



Detail No. 19.  
Metal Lath  
Plaster  
Concrete Floor Slab  
Expanded Metal  
Hanger  
Clips  
Metal Lath  
Channel  
Suspended Ceiling



Detail No. 20.  
Metal Lath  
Plaster  
Concrete Floor Slab  
Expanded Metal  
Hanger  
Clips  
Metal Lath  
Channel  
Suspended Ceiling

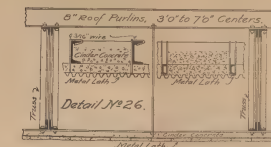


Detail No. 21.  
Metal Lath  
Plaster  
Concrete Floor Slab  
Expanded Metal  
Hanger  
Clips  
Metal Lath  
Channel  
Suspended Ceiling

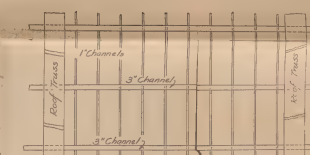


Detail No. 22.  
Metal Lath  
Plaster  
Elevation

Drawing No. 22.  
Fire Proof Smoke House  
Scale: 1/4" = 1'-0"



Detail No. 23.  
Metal Lath  
Plaster  
Ceiling Construction using Metal Lath.



Detail No. 24.  
Metal Lath  
Plaster  
Ceiling Construction

# The IRWIN Bit

Reg. U.S. Pat. Office

"Stamped on the  
shank of every  
genuine IRWIN  
Bit."

Use alone is the mechanic's test of a tool. Every year of the thirty-odd years that the Irwin Bit has been in use has been a year of test. This is the foundation of the user's faith in Irwin Bits.

Look for the name Irwin on the shank of the bit when you buy. That's the only way to be sure it's an Irwin through and through. The Irwin price gives you the best. To pay more, or less, is extravagance.

THE IRWIN AUGER BIT CO., Wilmington, Ohio.

## A Better Wall-Board at a lower price!

Because—

Huge modern mill facilities assure low production cost. \$3,500,000 investment. 15,000 acres of timber land owned by us and located at our mill doors in Wisconsin. 20,000 H. P. dam owned by us and built as a part of our mill. Daily capacity 300,000 square feet of wall-board.

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*all pure wood fibre*

The only wall-board made from log to finished product under one roof and one management. We control our quality from start to finish—Cornell Board is sized throughout—produced at a lower cost than possible for any other source of supply.

*Distributors Everywhere*

*Write for Samples, Prices, Dealers' Names, Etc.*

**Cornell Wood Products Co.**

General and Sales Office

Cornell, Wisconsin



## Beauty and Utility Go Together with Reynolds Asphalt Shingles

Light in weight, will outlast the guarantee. Economical in first cost and eliminate maintenance cost. The most artistic roofing material made, and gives the most protection against the elements. Unaffected by extreme heat or cold. Fire resisting—approved by National Board of Underwriters. Simply cannot warp, crack, split or curl. Look better and last longer than wood shingles, yet cost no more than No. 1 wood shingles. No builder or building owner should fail to get full particulars; interesting booklet sent on request.

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*Established 1868*

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of a neat design to complete the room and shipped it accordingly.

While the work was in progress the contractor found that he was having considerable trouble in working out the different sections, and in the event he overlooked the arrangement of the trimmings and finally got the work up wrong, in addition to putting up a design that should have been used in a basement or stock room. Consequently this is what happened:

First. The committee blamed the architect for specifying metal ceiling.

Second. The contractor condemned the manufacturer's design because it did not work out the way he thought it should.

Third. The property owners of the community and the members of the church, after seeing the ceiling, did not have much faith in a product of this kind. Finally one thing led to another until it was impossible to talk metal ceilings on any of the new prospects coming up in that locality.

Had the contractor known there were eighteen different and distinct classes of metal ceilings I know there would have been no cause for condemning a product that should be used in every modern building of today.

Metal ceilings are stamped in three different types, namely, lap, slip and jock joint, the first mentioned being used mainly. Lap joint plates are stamped with beads and buttons, sometimes furnished with the nail holes punched.

Slip joint plates are constructed with bead and button on two sides, while the ends are formed with a lock and tongue.

Lock joint plates, which are termed quadruple lock joint, are constructed with a lock on one side and one end, while the alternating side and end is formed with a tongue.

It cannot be impressed too greatly upon the minds of the public the necessity of a metal ceiling.

You no doubt have heard they are fire-proof, sanitary and artistic, etc., but one thing I believe you have not heard, and that is, if a metal ceiling is properly taken care of it will last a lifetime. I also find, if manufacturers are given sufficient time to prepare and submit samples and special plan of metal ceiling arrangement before the order is placed, there is no doubt but

what every public building that is being erected today would have quite a few items of metal ceilings for its specifications.

THE EDWARDS MANUFACTURING COMPANY.  
Geo. J. Kohler, Mgr. Ceiling Department.

### The Berger Manufacturing Co. Canton, O.

Had the rafters of the barn, which sheltered the famous Chicago fire cow, been covered with Berger's "Classik" Steel Ceilings, perhaps Chicago would not have burnt up. Practically every big fire is a development from a little blaze. When that blaze is confined to the room in which it originates it does comparatively little damage; when it spreads, a whole city may be razed. So any article entering into the construction of buildings which makes them fire retardant is worth knowing about.

Recently, at the official fire test held at the fire testing stations of the Columbia University, Greenpoint, N. Y., a very interesting comparison was made between the fire resisting qualities of steel ceilings and lath and plaster. Berger's Improved Pressed Bead and Button Constructed "Classik" Steel Ceilings turned the flames of a raging fire of 1800 degrees heat for a period of one hour and ten minutes (entire duration of test). *But lath and plaster fell six minutes after the test started.*

When we stop to consider for a moment the results of this test we are appalled—after only six minutes of such heat lath and plaster opens the way for perhaps a holocaust. The fact that Berger's "Classik" Steel Ceilings remained intact would seem conclusive proof that they are an effective fire retardant and worthy of a place in the specifications for modern buildings.

Since the widespread "Safety First" movement, owners and contractors are becoming more and more painstaking in their efforts to eliminate all danger, and an increasing number are using fire-resisting materials wherever possible in their buildings.

Another popular movement, which is working to the betterment of mankind, is sanitation. And here again steel ceilings show to advantage. They offer no pits or crevices for the collecting and permanent holding of dirt, filth or germs. They can be washed quickly, easily and as often as desired. They are the modern sanitary

# Fiberlic Building Board

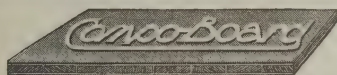
FOR INTERIOR CONSTRUCTION

Fiberlic products are both theoretically and practically correct, brought together not as a substitute for any other form of interior construction but as a distinct and original method.

Fiberlic construction may be carried on any time of the year. No time lost in drying. Gas fitting, plumbing, electric installation, laying of hardwood floors, building of stairs, fitting of mantles and other wood work may be carried on without interruption.

Fiberlic permits of great economy in alterations and repairs. Write for samples of Fiberlic Building Board and Fiberlic Paint Color Cards.

**The Fiberlic Company**  
CAMDEN - - NEW JERSEY



Trademark Reg. No. 94745

## Is More Than a "Wall Board"

because it handles so easy, saws smooth and clean, does not warp, shrink, crack or break, always lies flat and straight. It is the ideal material for:

- lining garages and outdoor sheds for warmth.
- lining summer cottages (helps keep them cool).
- quick repair partitions.
- enclosing rooms in attic or cellar.
- building dust-proof closets and cabinets.
- panels in wainscoting or beamed ceiling.
- shelves, drawer bottoms, cabinet backs,

and 1001 other purposes.

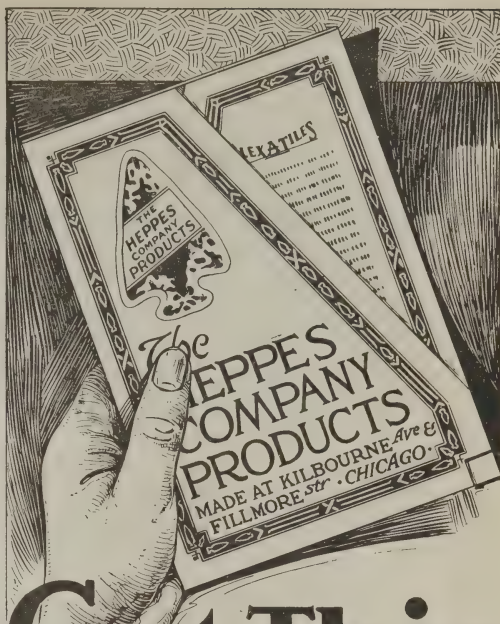
It's the center core of kiln-dried wood slats that makes Compo-Board so strong, durable and satisfactory in so many ways.

It's this same patented feature of construction that makes genuine Compo-Board so easily identified. Look for this wood core when you buy, and avoid disappointment.

Sold by dealers everywhere in strips four feet wide and in lengths one to 18 feet as desired.

Write for interesting book and free sample piece.

**Northwestern Compo-Board Co.**  
5776 Lyndale Ave. N.  
Minneapolis : : Minn.



# Get This Reference Book on Roofing

JUST off the presses. Our new handsomely illustrated roofing reference book. Of interest to every contractor, builder and carpenter.

It explains all about our various brands of roofing and shows the actual colors of our sturdy asphalt shingles *just as they look on the roofs.*

## Liberal Free Samples of the FLEX-A-TILE "GIANT"

a new asphalt shingle accompany the reference book.

Flex-A-Tile "GIANT" Asphalt Shingles are 50% thicker, 50% heavier and 100% stronger than the standard asphalt shingle. This means a 25% saving in labor.

Flex-A-Tiles are also made in standard weights and can now be had in five (5) handsome colors red, greenish gray, garnet, emerald and brown. See Reference Book for full information.

Flex-A-Tiles make handsome roofs and afford you handsome profits.

Drop a postal or write today and we will send book and samples for your files. This reference book is one that every contractor, builder or carpenter can show to his prospective customers.

## THE HEPPES COMPANY

Manufacturers Also of Asphalt Paint, Asphalt Roll Roofing in Any Finish and Utility-Board, the Preferred Wall-Board

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ceiling—moderate in cost—easy to erect and suitable for all types of new or old buildings, including business houses, residences, churches, etc. The wide range of Berger's "Classik" designs offers a harmonious and appropriate style of decoration for each room.

All building owners, contractors or parties interested are invited to write us for a copy of our "Classik" Steel Ceiling catalog and complete particulars of Steel Ceiling Official Fire Test.

### **The Faultless Iron Co.**

St. Charles, Ill.

The "White House" line of All-Metal Kitchen Furniture built by us in our plant at St. Charles, Ill., is worthy of careful consideration of architects and builders. This line is new and unique and the builders of same state that the cost is but little above that of wooden equipment after considering the cost of finishing the latter.

This All-Metal Furniture is made of heavy patent levelled furniture steel covered with three coats of white enamel baked on and equipped with solid brass concealed hinges and glass knobs. These Cabinets are not only beautiful in appearance but will last for an indefinite period without warping or shrinking, and there is no question but that this equipment placed in apartment buildings, etc., is a strong drawing card with tenants, marking the apartment as being distinctly high grade.

This new equipment is built on the unit system, which means that we can supply a large number of stock size units different in size and shape, but all of which can be added together in a manner similar to the erection of sectional bookcases or office filing devices, thus enabling the architect or builder to supply equipment for any size kitchen or pantry from stock units, which reduces the cost and saves labor on the part of the architect and builder.

We have already equipped some of these finest apartments in New York City and Chicago and have several contracts for more of this work. We are also equipped to figure on special equipment of this kind for hospitals, domestic science kitchens,

or any other work where sanitary steel equipment would be required.

### **The Mack Iron & Wire Works Co.**

Sandusky, Ohio.

You remember that old story about the Scotchman who was enticed to go to a race track, and being explained the method of placing bets, wagered \$1.00 on a ten to one shot. His horse galloped home winner and Donald was the first man at the bookmaker's stand. After receiving his winnings he gazed reproachingly at the bookmaker. "Mon," he said, "how long has this thing been going on, and me not knowing it?"

Well, that's the way we feel about you. You are missing something in not getting acquainted with us for we know you require iron work on some of your contracts and we believe we can save you some money if you will only give us a chance to give you a figure on it.

We have just issued a new seventy-six page catalog that we believe should be on every contractor's desk. It is about as complete as we have ever issued, and gives a lot of information about our work and what it costs.

You know it is not always convenient to send plans to people like us to get prices on an iron stair, or a railing, etc., when you are only figuring on some job; well, we also realized this and have tried to give prices on work of this class that will enable you to figure intelligently from our catalog.

Take iron stairs for instance; it's a pretty hard job for the average contractor to jump at a price on an iron stair; we have worked out a system of prices in our catalog that will enable you to get a fairly accurate cost on same without having to send us a bunch of plans. Of course if you have landed the job then send the plans along and we will give you a figure that will interest you.

We also specialize on Elevator enclosures, fire escapes, balconies, sidewalk doors, wire work of all descriptions, lawn seats, jail cells, etc.

Remember the Scotchman and let's get acquainted.

# ROBERD'S OAK WALL BOARD

## OUR OAK FINISH

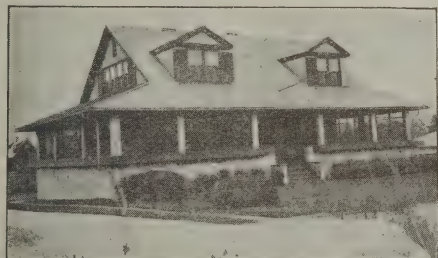
is NOT pasted on, nor is it in any way a mechanical or imitation design of oak, but is an exact reproduction of the genuine wood, so perfect that even the most skilled observer cannot detect it. Our Oak Wall Board is produced by an exclusive process which is controlled by us and is furnished in either 32 or 48 inch widths.

## ROBERD'S Ideal Wall Board

in the new Oak Finish has a thousand uses. For wainscoting or paneling it is unsurpassed. Will give the most artistic and beautiful results at the minimum cost.

Write today for free samples and prices of our complete wall board line. Finished in gray, tan, mission oak and quarter sawed oak.

**The Roberds Mfg. Company**  
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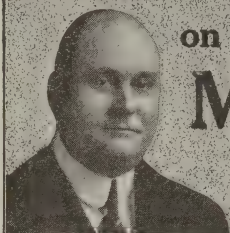
We want to quote you on car lots of cypress anywhere or if you are in the New England or North Atlantic States let us quote on "Anything in Wood or Woodwork" for architect and builder.

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Gutters, Mouldings, Doors, Finish, Casework, Etc.

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**Wm. F. King**

19-21 Kingsland Ave., Brooklyn, N. Y.

When you install that dumb waiter remember there are four points to be considered: safety first, endurance second, simplicity third, and cost fourth.

The "A. B. C." Dumb Waiter manufactured by Wm. F. King, Brooklyn, N. Y., meets all these requirements.

The "A. B. C." Dumb Waiter equipped with the King Safety Check or Automatic is the safest waiter on the market. It is built of the best material, all bearings properly proportioned to give long life and quiet running. It is so simple both in installing and operating that any one handy with tools may put it in and a child can operate it. All these three features—safety, endurance and simplicity—no doubt are responsible for the general adoption of the "A. B. C." Dumb Waiter in the New York apartment houses. Many of these houses have forty-eight families and one dumb waiter serves them all. The King costs no more than a reliable machine should and it will outwear several cheap ones.

**Galesburg Sheet Metal Works**

142 So. Prairie St., Galesburg, Ill.

You have a barn, granary, or other buildings of this class for the profit which can be derived from them. Consequently, you are willing to place improvements that will produce profits.

These buildings if properly equipped will bring you profits. Irrespective of how sanitary and modern your building may be, unless provided with a "Gale Ventilator" you are going to be disappointed because you have not provided for the most essential of all life elements, which is pure, fresh air.

Without proper ventilation the live stock will be unhealthy, lose in weight; grain will become moldy and corroded. Eventually, you cannot command high prices and therefore lose profits.

Undoubtedly, you ask why you should purchase a "Gale" in preference to other styles.

There are many advantages secured by a "Gale" which are superior to other manufactures. The "Gale" has been pro-

nounced scientifically true and is manufactured under skilled labor. It draws up the impure air and keeps an almost continued round of pure air in circulation at all times without the slightest draft detectable in the building.

It is provided with a weather vane which is so delicately balanced that it will yield to the slightest breeze.

The certainty that the "Gale" lasts a lifetime makes it indispensable. It is made from extra heavy galvanized iron, especially non-rust proof. Constructed to resist wind and storms and is screened with a heavy wire mesh on the inside to prevent birds from entering. This ventilator is so constructed that any man with ordinary ability can erect it. It is handsome and attractive in appearance and presents an up-to-date look to the building on which used.

The "Gale" is made in different sizes. The weight is only a trifle as compared with a wooden cupola ventilator of the same size. This takes the heavy load off the roof timbers.

Taking into consideration the many advantages obtained by the provision of a "Gale" the cost is extremely reasonable and is said to be 50 per cent less than for a wooden cupola. Therefore, every "Gale" you place becomes a distinct asset of from two to three hundred dollars to the building on which used.

We will gladly mail you prices and catalogue upon request.

**The York Automatic Dumb Waiter Works**

643 W. Market St., York, Pa.

Our Automatic Dumb Waiter is a most ingenious device for saving labor about the kitchen of the modern home, as well as the old-fashioned home being remodelled to present-day standards.

The wonder is so many houses, complete in every other respect should be constructed without any provision for a device of this character. Its absence can only be explained on the theory that labor is so cheap that it does not pay to save it. This theory is no longer tolerated, and in consequence there is a great deal of remodelling being done to bring buildings up to date, and the new buildings are far

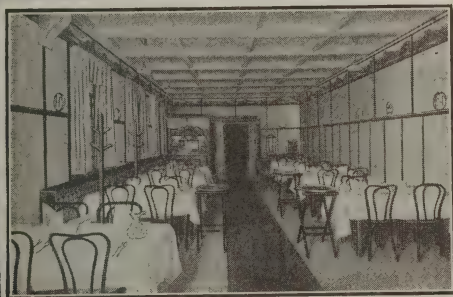
## An Exact Reproduction of CAL-CO-CRAFT

### Not a Wall Board, But a Wall Paper

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## CAREY CEIL-BOARD

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Carey Ceil-Board pleases the owner because it makes no dirt when being applied and can be decorated as desired—paint, paper, tint—or left in the original finish—Gray, Tan, Mission Oak, Golden Oak and Circassian Walnut.

Carey Ceil-Board pleases the builder because it is so inexpensive and easy to apply he can make prices that get the business and still make more money himself.

Send your name and address for free samples, description and complete instructions.

Carried in stock by our branch houses in most big cities and by best dealers.

**THE PHILIP CAREY CO**

1002 Wayne Ave., Gen'l Offices, Lockland, Cincinnati, Ohio



## Carter Standard House Painting Specifications

¶ When asking for an estimate or making a painting contract, it is necessary only to specify the number of coats, and the colors to be used for Body, Trim, Sash, Roof and Porch Floors, and add "Work to be done according to Carter Standard House Painting Specifications."

¶ Paint to be applied only when the surface is thoroughly dry, and never when rain or snow is falling.

¶ Knots, pitchy and sappy places to be coated with pure orange shellac and after the priming coat is dry, all nail holes, cracks and other defects in the lumber to be filled with putty made of pure linseed oil and equal parts of white lead and whiting.

¶ All loose paint, blisters, dirt and dust to be removed and the surface sandpapered smooth. If old paint is cracked and scaled, all of it is to be removed down to the wood by burning and scraping or with a liquid paint remover.

¶ All porous places in the lumber, and all flat spots which show in the priming coat to be touched up with a thin coat of Carter pure White Lead and pure linseed oil.

¶ Priming Coat to be Carter pure White Lead, pure well-settled linseed oil and turpentine mixed in proper proportions to suit the requirements of the surface.\*

¶ Second and third coats on new work and both coats on old work to be Carter pure White Lead, pure well-settled linseed oil, pure turpentine and drier, colored as directed with first quality tinting colors and mixed to the proper consistency. Paint to be well brushed out and sufficient time allowed between coats to insure perfect drying.

¶ Porch floors and steps to be painted with Carter White Lead and linseed oil paint, to which has been added litharge or outside varnish.\*

\*See Carter Paint Calculator.

*The Paint Information Bureau*

**Carter White Lead Co.**

West Pullman Station "B" Chicago, Ill.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



# Show This Advertisement to the Home Builder

## Boudoir Floors

My Lady America is Exquisite. Her daintiness, her discriminating taste and her personality are impressed on all with whom she comes in contact, emphasized by all she does. Her apartment is the lightest, the airiest, the most attractive, the most inviting in the home. Encourage my lady by providing

## Suitable Floors on Which to Tread

Because we do not want the least shadow to darken her path we give her Maple, Beech or Birch Floors.

They have the exquisite appearance and the substantial character that appeal to the one for whose use they have been perfected.

No floor can be beautiful or attractive unless it is durable, and durability is an essential quality of Maple, Beech and Birch Floors.

This year you will finish many apartments for Lady America. If you wish to make her your lifelong friend, strongly recommend the use of Maple Flooring, finish in natural color, and trim the room to harmonize with the floor. She will do the rest.

"Your Flooring Problem Solved" will help you to solve  
"Her Flooring Problem." Send for copy.

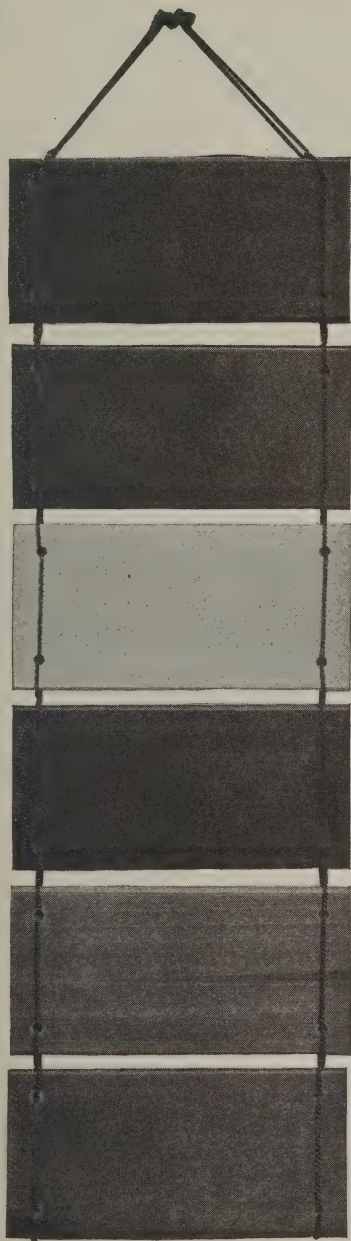
**Maple Flooring Manufacturers' Association**  
Stock Exchange Building Chicago, Illinois

PASTE THIS DOME  
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# HANG UP IN YOUR SHOP



THE set of Six Birch Panels here illustrated. Each panel is 3 x 5 inches in size, and carries a stain of proven reliability on Birch. Full directions for the application of the stains are printed on the back of the panels, and the whole set is substantially strung on heavy cord ready to hang up.

THE set will make an attractive display in your shop and at the same time help your clients in the selection of color schemes and styles of finish.

YOU will also find our Birch Book helpful. It describes and illustrates in detail the many uses of Birch for interior trim, doors, floors and built-in work, and is a source of reliable information upon Birch.

□ □ □

*Write today for the Panels and  
Birch Book "D." Sent  
Post paid*

□ □ □

**The Northern Hemlock & Hard-  
wood Manufacturers Association**  
Department D      Wausau, Wisconsin

PASTE THIS DOME  
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more complete than they were even a few years previously.

Any housewife will tell you in a moment how much a dumb waiter will save her. Just between the kitchen and cellar an ordinary dumb waiter travels over 60 miles a year, and in that time carries about seven tons of kitchen necessities up and down. Without this service some one would have to pack this load up and down the stairs.

Our Sanitary Automatic Dumb Waiter has now been in use for about nine years, and has proven its value thoroughly. Improvements have been made from time to time, one of the latest allowing the dumb waiter to be iced, making it a dumb waiter refrigerator, in the kitchen when needed and out of the way in the cool basement the rest of the time.

Of course, we make several styles and sizes, to suit every building and condition, and our circular describes the entire line.

#### **Huther Bro. Saw Mfg. Co.**

1105 University Ave., Rochester, N. Y.

#### **SAWS AND SPECIAL CUTTERS.**

Thirty-five years ago we started to make a line of saws and special cutters that would increase the efficiency of the ordinary saw table. The first tool in this line was our Patent Dado Head and the many satisfied users of this tool made its success evident. This was followed by special groovers, patent matchers, panel raisers, special saws

for cutting slotted joint in window sash and our Patent Cutter Head to cut mouldings, sash, stops, treads, etc. All of these tools fit the ordinary saw table or shaper spindle.

We are always glad to give any possible help on your saw problem. Write us—no obligation on your part.

HUTHER BROS. SAW MFG. CO.,  
1105 University Ave., Rochester, N. Y.

#### **The Crescent Machine Co.**

10 Main St., Leetonia, Ohio.

It would give us pleasure to personally greet each one of the readers of your paper because we recognize them to be live, wide-awake and always on the lookout for something new. Something that will improve their condition and we always take keen pleasure in meeting such men. Through the columns of your paper we want to extend each and every one of them a Hearty Greeting, and we wish to express the hope that each and every one of them will be more prosperous in 1915 than he has ever been before.

We take pardonable pride in saying that we feel that we have been instrumental in helping to make many of your readers quite prosperous in years past, and we want to extend our help to any of the rest of them who may be interested in first class wood working machines.

Very truly yours,

THE CRESCENT MACHINE CO.

## **TRADE REVIEW**

### **An Impersonal Chum**

No doubt you remember reading—at least when a boy—of hunters and of conquerors who spoke in the most endearing terms of their "trusty" rifle. You know such men are not given to slushy sentimentality, but you can readily understand their feelings about this bit of inanimate "cold." It has saved their lives on many occasions.

They look at it with the same gratitude with which we would look on any man who had saved us from sudden death.

With a feeling akin to this, the good mechanic looks at his tools. While they do not save his life, they do something almost as important for him, they help him make a good living.

That is why a good mechanic is as particular about choosing his tools as he is about selecting a wife.

That is also the reason why Red Devil Tools have earned the nickname "the mechanic's pet" the world over.

These tools are made by Smith & Hemenway, on the somewhat new but common-sense principle that tools are not primarily made to be sold, but to be used; that each particular tool should be designed to serve a particular purpose in the most efficient and "workmanlike" manner.

In other words, what has made Red Devil Tools so successful is the fact that the manufacturers do not consider them

# Some Suggestions for Increasing Your Business —by using MORGAN DOORS and Millwork:—

- 1—In new buildings of any size or cost—cottages, bungalows, residences, offices, apartments, institutions.
- 2—Many old houses will put in new front MORGAN DOORS if you will suggest to the owners what a great difference it will make in the looks of his property and how much better service he will get out of a MORGAN DOOR.
- 3—Suggest the installing of a MORGAN Mirror Door to a list of families where there are growing daughters.
- 4—Some people in your town would welcome the suggestion of installing a new MORGAN sideboard, buffet or medicine chest.
- 5—Many residents in your town will build a new and larger porch or screen in the old one if you go to them with a definite suggestion.
- 6—Every house ought to have a sleeping porch, but most people think they cost too much. You know what it costs—why not tell them?

The contractor who digs up business is the man who will get it this year, and it will be a big year if we all hustle. Provide yourself with the Morgan Millwork Handbook at once and get busy.

*Your dealer can supply MORGAN DOORS without delay from our immense stock*

## Morgan Sash & Door Company

Department A-22, CHICAGO

FACTORY: Morgan Co., Oshkosh, Wis.  
Eastern Warehouse and Display  
Morgan Millwork Co., Baltimore

DISPLAYS: 6 East 39th Street, New York  
309 Palmer Building, Detroit  
Building Exhibit, Insurance Exchange, Chicago



Do you realize the possibilities of Parquet Flooring as a money maker?

Do you appreciate the high favor in which it is held by owners, builders and contractors?

Do you know that "Price" is no longer an objection because Federal Parquet Flooring costs practically the same as good strip flooring?

Do you grasp the many chances offered you for good profitable jobs of Parquet Flooring or do you lose them because you don't know where to get the Right Parquetry at the Right Price?

Federal Oak Parquetry is of the finest quality of Kentucky White Oak, thoroughly kiln-dried; accurately milled; of uniform color, character and design!

Easy to lay according to directions supplied with each shipment.

Usual sizes in stock; special sizes to order.

Write for Special Circular No. 91

**Federal Parquetry Mfg. Company**

Offices: 175 5th Ave., New York Mills: Lexington, Kentucky

Agents wanted wherever we are not now represented

## Attention Carpenter Contractors

Keep busy during the winter months laying Wood-Mosaic Floors of Hardwood. Large quantities of our flooring are laid in old houses as well as new. We make all kinds and thicknesses: Wood-carpet, Strips, Plain and Ornamental Parquetry.

We will furnish without charge, upon receipt of accurate measurements of rooms, colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for catalogue and a free copy of our book, "Wood-Mosaic Floors."

*Catalogued in Sweet's Index*

**Wood-Mosaic Company**

33 Hebard St., Rochester, N. Y.

Saw Mill and Flooring Factory: New Albany, Indiana  
Sales Office and Parquetry Factory: Rochester, N. Y.



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merely as an "article of commerce," but as an instrument that must do its share to assure the American workman the supremacy of reputation that has made him famous as the most skilled mechanic in the world.

Smith & Hemenway Co., 164 Chambers Street, New York, publish a "family album" of about a thousand Red Devil Tools, and will be glad to send it to anyone who wants it, free.

### **Saving Profits on Millwork.**

Millwork plays such an important part in the modern home that too much care and attention cannot be devoted to a wise choice. Millwork that is in good taste and strictly in keeping with the purpose for which the rooms are to be used is absolutely necessary. And too, a good grade of millwork half furnishes the room.

Many of our contractors have found from experience that it pays to buy this material from advertisers. The largest manufacturers are able to give better service and better prices than can usually be obtained from local dealers. Also there is the up-to-date-ness of the designs to be considered. Old styles certainly detract from the good looks of the home and any contractor should be particularly careful in obtaining what he can rely upon to be thoroughly modern in every respect.

Making dollars count is the secret of saving money. Competition is too strong nowadays for any contractor to take a chance on specifying inferior trim or millwork of any description. Often times the saving of the middleman's profit decides the letting of the contract. In many cases the contractor by ordering his material direct from the manufacturers and saving dealer's profits can under bid all competition. Of course, it does not pay to buy direct unless you are assured that you are getting good value for every dollar you spend. In the end it is not how cheap but how good that should have the most force with you.

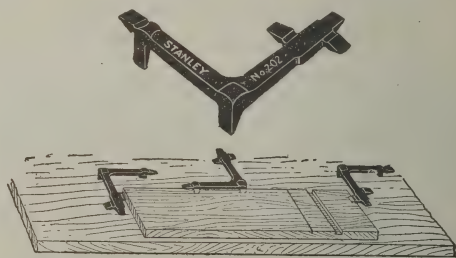
The Cleveland Window Glass and Door Company, 209 Champlain Ave., Cleveland, Ohio, have been for years intelligent and scrupulous manufacturers of high quality millwork that is sold at a very fair price. Their doors are particularly attractive and

enough designs and sizes are carried in stock to please the most particular builder. Particular attention is called to their White Pine and Fir doors because these have shown themselves to be universal favorites.

We know you can save money by dealing with the Cleveland Window Glass & Door Company because other contractors have done it. They have a reputation for sound business practice, dollar for dollar value, prompt attention to orders, quick shipment and thorough responsibility. They will be glad to send you the special literature pertaining to their products if you will just drop them a line or two asking them to do so. Address the Cleveland Window Glass & Door Co., 209 Champlain Ave., Cleveland, Ohio.

### **The Stanley Portable Bench Dog.**

The cut herewith shows the Stanley Portable Bench Dog so clearly that words are really unnecessary regarding it. By the use of one or more of these Dogs any piece of work can be held securely to any



desired position on the bench or other working space. This Dog is valuable also in connection with a fixed Bench Dog as it will steady the free end or side.

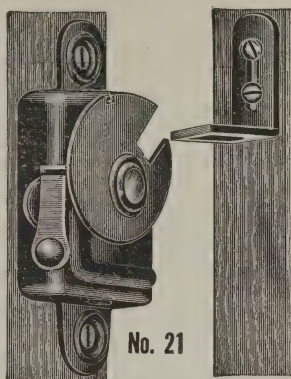
This Bench Dog known as No. 202 is fully described with prices, etc., in the Stanley Catalog which is sent to our readers on request.

### **Valuable Reference Book on Roofing.**

The Heppes Company, 1012 So. Killmorne Ave., Chicago, Ill., have just published a complete reference book of all their different lines of roofing. This book is unique in that it shows the different brands of roll roofing manufactured by the Heppes Co., just as they look on the roofs. Particularly timely is their offer to include with the copy of this handsome reference book,

## HERE IT IS Automatic Screen Door Catch

Just what every housewife is looking for. No more open screen doors—good bye easy access for flies. Wind can't blow door open. The best and simplest on the market. Automatic catch—with or without night lock. Simple in construction. Door easily opened by any person when night lock is open. Door cannot rebound or rattle.



No. 21

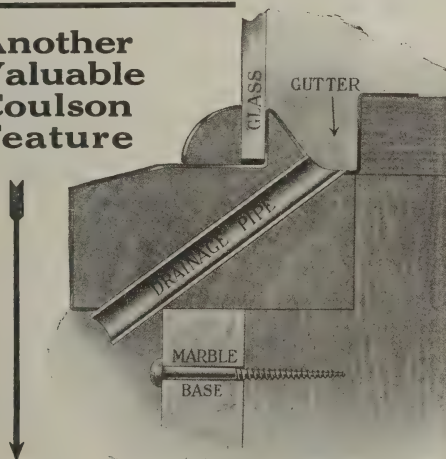
### The Best Door Catch on the Market

Light trip and strong hold. Only four (4) screws to set. Every home needs at least two. Easy to set and **sure to please**. Furnished in Brass or Steel.

Ask your dealer. If he can't supply you send us his name. Write for information on other screen hardware and time saving hardware specialties. Our Wrought Steel Butts give better satisfaction.

**Watrous-Acme Mfg. Co., Des Moines, Iowa**  
Chicago Sales Office: 180 No. Dearborn Street

### Another Valuable Coulson Feature



#### For Good Store Fronts

The illustration shows how we provide for removing moisture; this is one of the many features that make *Coulson Store Fronts* preferred by discriminating owners.

Installing Coulson Store Fronts is a profitable business for you; investigate by writing for our proposition.

**J. W. Coulson & Co., 95 W. Spring St., Columbus, O.**



## PEARL screens pay back their cost—

in extra wear—in freedom from paint expense and repair bills—genuine PEARL Wire Cloth pays back its cost many times over.

For screening porches, doors and windows, this material is so much superior to "galvanized" and "painted" kinds that there is positively no comparison.

Rust, *not* wear, ruins screens. Genuine Gilbert & Bennett PEARL Wire Cloth is as near rust-proof as metal can be made. That's why it wears so well. No other screen is made like PEARL so no other screen can *wear* like PEARL.



**For Screening Doors, Windows and Porches—**  
Made in Two Weights—Regular and Extra Heavy

The cost of genuine Gilbert & Bennett PEARL Wire Cloth is far below the value it offers in wear and appearance.

It is stiffer in texture than ordinary wire cloth—an accidental bump from a piece of furniture won't affect it. Combined with its rust-proof qualities this is an additional guarantee of long wear and satisfaction. Don't be deceived. There cannot be a "just the same as PEARL." The manufacture and application of the non-crack, no-chip coating from which it derives its wonderful rust-resisting qualities is a secret process, the exclusive property of this company.

But to be sure of PEARL wear you must get genuine PEARL Wire Cloth with two Copper Wires in Selva and the Round Tag bearing the Gilbert & Bennett name on each roll.

**The Gilbert & Bennett Mfg. Co.**  
(Established 1818)

Dept. S 277 Broadway, New York Dept. S 38 So. Dearborn St., Chicago

Georgetown, Conn.  
Kansas City, Mo.

Write our nearest office for samples of both Regular and Extra Heavy PEARL, full details regarding same and the name of nearest dealer.

**The Best Hardware Dealer in Your City Sells "PEARL"**



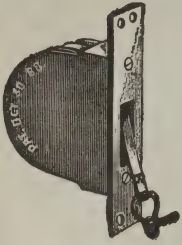
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ON LETTERS YOU  
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## Caldwell Sash Balance



Does away with weight and cords and **vastly** more durable. Makes sashes work perfectly. Permits greater window space in new work, as box frames are not necessary. May be applied to old windows without altering sashes or frames.

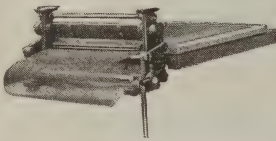
Write for Circular to

**Caldwell Mfg. Company**  
2 Jones St., Rochester, N. Y.

samples of their new Flex-a-Tile Giant Asphalt Shingles. The Flex-a-Tile Giant is claimed to be not only 50% thicker, 50% stiffer and 100% stronger than any standard asphalt shingle, but it possesses the quality which only the finest and most carefully chosen materials can assure.

Every contractor should have this reference book in his files, together with samples of all the Heppes roofings. As is well known to the trade in general, the Heppes Company have for years specialized in the very best brands of roofing on the market. Their new factories are said to be the best and most thoroughly equipped of any roofing factories in America. To use their own expression, Giant machinery, Giant processes and Giant experience are the elements which give the name Flex-a-Tile, and particularly the name, Flex-a-Tile Giant Asphalt Shingles, their splendid reputation everywhere.

We urgently advise every contractor to send for this new reference book, which in itself is a work of art, in addition to its informative value, and to ask at the same time for the samples which the Heppes Company will willingly send.



## Miller's Screen Wire Stretcher

Will help you make screen doors and windows in half the time. Insures a snug-fitting, evenly stretched screen without sag. Saves its own cost. Operated by foot and holds wire tight until tacked.

Write Now For Circular and Price

on this and on my Sliding Arbor Cut-Off Saw, Clamping Bench and Laying Out Table, Moulding Mitre Cutter, etc.

**A. N. MILLER, 750 38th St., Milwaukee, Wis.**  
Manufacturer of Special Sash and Screen Making Machinery

## Galvanized Iron Cut Nails

For shingles, slating, boat and wharf building, fencing, sheathing and all exterior work use

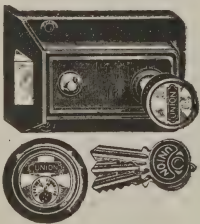


## Anchor Brand Iron Cut Galvanized Nails

as they will outlast the best of wood under all climatic and weather conditions.

Write for Prices

**E. & G. Brooke Iron Co., Birdsboro, Pa.**



## No. 0132 Cylinder Night Latch

Value \$1.25  
Special Sale **90c**

Postage Paid

Send for our money-saving hardware catalog

**COBB, WHYTE & LAEMMER CO.**

Dept. 7 177-179 No. Clark St., Chicago, Ill.

## Helpful Painting Hints.

The March issue of "The Carter Times", a painters' magazine published by the Carter White Lead Co., is a special interior decorating number. The leading article is on "Inexpensive Methods of Finishing Interior Woodwork." The writer, W. M. Reynolds, is an interior decorator of much experience.

Other detail instructions are given for the most popular finishes for bed-rooms, bath-rooms, living rooms, dining rooms and kitchens of modern cottages or bungalows. Cost is considered as well as service. The article is not an exploitation of any particular brand or kind of material.

A method of finishing old floors to make them very attractive at small expense will be explained so any painter can get the desired finish. Another article on "The Use of Oil Colors for Mottling and Blending and Tiffany Glaze" on plastered walls, etc., is set forth in a very clear way.

The Carter White Lead Company, West Pullman Station "B", Chicago, Ill., will

Advertisers' Section

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## Hudson Asphalt Shingles Red or Green

—make durable, attractive and economical roofs for all kinds of buildings where shingles can be used. Positively will not crack or break, resist fire, require no painting. Colors are non-fading. Write today for samples and literature.

**Asphalt Ready Roofing Company**  
9 Church Street - - New York, N. Y.



High School, Dassel, Minn., fitted with UNIT Sash Balances throughout.

Many of the best buildings now under construction are fitted with

## Pullman Unit Sash Balances



instead of the old fashioned cords and weights.

UNIT Balances are noiseless, present a fine appearance and last almost indefinitely. Box frames are dispensed with, permitting the use of narrow mullions, and reducing the cost of the woodwork.

### Uniform Size Face Plates

Makes the cutting of mortises just as easy as for sash pulleys.

UNIT Balances can be installed with less labor than cords and weights, and usually at an actual saving in cost, at the same time perfect working windows are assured.

*Catalog with blue prints sent on request*

**Pullman Mfg. Co., 12 Industrial St., Rochester, N. Y.**



## SASH MOUSE

EVERY CARPENTER NEEDS  
The "Han-cot" SASH MOUSE

It saves so much time and trouble when you are stringing sash cord. Consists of fastener, chain and weight, and weighs only 3 ounces. Length 59 inches.

Send for one NOW. Price 30c, postpaid.

■ FREE ■

Write for our Free Offer of a Guaranteed Chisel to carpenters in towns of 2,000 or over.

**Handley & Cotterman**  
Dept. B, 164 N. Wabash Ave., Chicago

No. KSB  
1/2 inch  
Price \$0.65

No. KSB  
1 inch  
Price \$0.70

No. KSB  
1 1/2 inch  
Price \$0.50

**KEEN KUTTER**  
Chisels

are sold to you with the absolute guarantee of money back if you are not satisfied. Put them to any test—they will prove true. Famous for their clean cutting quality and ability to hold their edge.

**Send for our Home Furniture  
Design Booklet No. M 976**

*If not at your dealer's, write us.*

**SIMMONS HARDWARE CO., Inc.**  
St. Louis      New York      Philadelphia  
Toledo      Minneapolis      Sioux City      Wichita

**FREE!!**

## Sash Cord Fasteners

Equip a window with Bull Dog Sash Fasteners at our expense. The box of fasteners, shown above, will be sent free to any builder upon request.

Quit tying knots in sash cord; use "Bull Dogs" and save half the time. Use them for the sash and weight ends—they cannot let go. No tools needed. Good for chains, too. Provide maximum distance of travel of weights. Cost little, save a lot.

Send a postcard for large box of samples and prices.

**The Allen-Sponsel Co.**  
197 Pearl Street  
Hartford, Conn.

Trade Mark  
Reg. U.S. Pat. Off.

Pat. Aug. 11-14

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## C. E. Jennings' Carpenters' Tool Cases

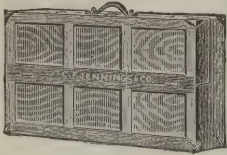


Illustration of Tool Case No. 35

Write for circular of our Little Wonder Tool Kit No. 60

Largest Tool Chest Line  
"Made in America"

C. E. JENNINGS & CO.

Sole Manufacturers 71-73 Murray St., New York



## Tools Marked Like This



Last a Lifetime and Give Satisfaction to the End!

The Highest Priced Edge Tools Made

Ask for our catalog, book "True Stories" and "How to Take Care of Tools"—free.

**Mack & Company**

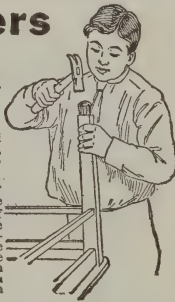
Brown's Race Rochester, New York

## Boss Carpenters

and Journeymen Carpenters have many a week with no work. Why not attach to Chairs and Furniture Evergrip Gliding Casters? We furnish plenty Free Demonstrating Sets.

### HERE'S OUR OFFER

Send your business card or letterhead and we will send you 100 sets. Also 25 FREE Demonstrating Sets. Sell the 100 sets for 10 cents a set. Your profit \$6.50. Send no money till all are sold. Then order more. With each lot we send 25 Free Demonstrating Sets with each 100 sets. If the Boss Carpenter can't spare the time, arrange with your journeymen and divide profits. Thousands can be sold. The public will appreciate the Free Demonstrating Sets and buy 6 to 20 sets. The good will of the people thus secured may result in carpentry work for the boss. Either way you win. We have over 150 Carpenters doing well with this proposition. Now Carpenters go to it!



STRANSKY MFG. CO., Dept. R 20 Warren Street, NEW YORK

## Are You Going to Build?



Send 25c in silver (and 10c postage) for our big \$1 book of plans. "LOW COST MODERN HOMES," with houses from \$1,000 to \$3,000. "PALATIAL MODERN HOMES" from \$3,000 to \$10,000, price 25c and 12c postage. "COTTAGES AND BUNGALOWS" from \$300 to \$9,000, price 25c and 5c postage.

**J. H. DAVERMAN & SON, Architects**

1342 Murray Building GRAND RAPIDS, MICH.

send a copy of the Carter Times to any contractor who expresses a desire for it.

## The "Hoosier" Self-Feed Rip Saw.

A large part of the jobbing carpenters' work consists in ripping up material. For this reason the Sinker-Davis Company, Indianapolis, Ind., have designed the "Hoosier" Self-Feed Rip Saw to do the carpenters' work with the greatest expedition. The circular describing this saw indicates that it is more than a rip saw, that it is capable of a considerable variety of work, while its construction and general design makes it of immense value in the shops.

Those of our readers who are interested in machines of this character should have the above mentioned circular as well as the general catalog of the Sinker-Davis Company.

## More Profit for the Shop Workers.

When a man can combine pleasure and profit it usually pays to do it, and some fine opportunities crop up every now and again. We have all seen those handsome tall, hall clocks like the one that used to stand in Grandmother's hall and chime the hours with as pretty a peal of music as one ever heard. There are not many of these clocks to be had now, for the lovers of antiques have cornered them all and to buy one would cost an unheard of sum.

But this needn't prevent anyone from having a handsome hall clock at a very moderate price. As long as a man can handle tools and is willing to put a little time and trouble into the thing he can build as nice a clock as he wants. The case can be made of any wood desired and the complete works can be bought at a very moderate price.

The Clock Company, 1657 Ruffner St., Philadelphia, Pennsylvania, make a specialty of furnishing unusually fine clock works for hand made cases. These works

Advertisers' Section.

## Estimator's Price Book

World's best book on estimating. 217 pages; cloth bound; price \$1.25.

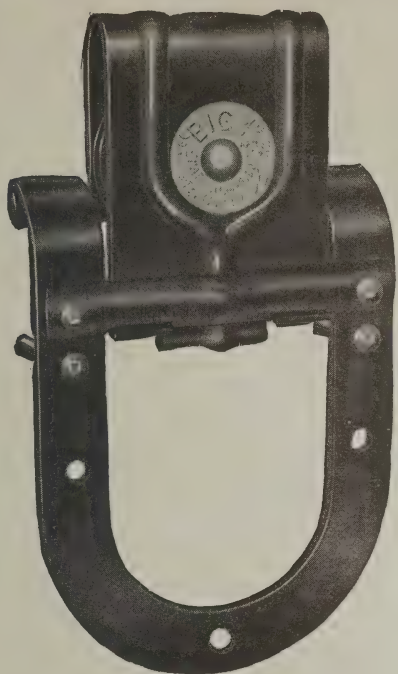
Hicks' Estimating Data Blank. Insures accuracy and easy estimating. Sample book, six blanks, 10 cents.

I. P. Hicks, D1 Ames Station, Omaha, Nebraska

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WRITE TO ADVER-



ON LETTERS YOU  
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## IMPROVED BIG 4 HANGER

Already the leader of Barn Door Hangers, we have still further improved this one by corrugating the steel hood, by giving it a couple of stiffening crimps.

Big 4 Hangers are made entirely of heavy steel, yet are built along the most simple lines, combining durability and strength with our popular *non-cuss* features, stay on, swing out, no stick, no bind, no rust, no cuss—which we always build in. It is also a combined *flexible* and *rigid* hanger. Try it on some of your spring building jobs. It's an investment, not an expense.

Ask for booklet, "Sliding Barn Door Equipment," and send dealer's name.

**National Mfg. Co., Sterling, Ill.**

## Fellows! You Ought To Have These Books



**YOU** architects and contractors who want to get away from that monotonous sameness in the appearance of your jobs—you men who want to instill durability, character, dignity and unusual beauty into your building—you ought to have these books. One tells about the remarkably artistic effects secured with

### KELLASTONE IMPERISHABLE STUCCO

—how it embodies no Portland cement, lime or gypsum. How it withstands far greater settling strains than any other stucco without cracking.

How it is a non-conductor of heat, cold and dampness and how it possesses greater tensile and tension strength than cement stuccos. It tells how easily Kellastone can be successfully applied over wood lath, metal lath, byrket sheathing, hollow tile, brick and stone walls, and how perfectly it bonds to door and window casings.

It tells how valuable Kellastone is in remodeling old buildings, and the beautiful stucco and plaster effects it produces. And it tells how Kellastone can be applied with the same success in winter or summer. The other book tells about

### Kellastone Composition Flooring

and how it is composed of materials in powder and liquid forms, which, when mixed and spread, form a tough, seamless mass over the entire floor including cove and base, if desired, thus providing a sanitary, durable floor without seams or joints.

It tells how Kellastone Composition Flooring can be laid on bases of concrete, wood or steel. How its lightness, warmth, resilience and quietness make it especially adapted for hospitals, schools, theatres, office buildings, public buildings, private homes, apartments and manufacturing establishments.

#### Send For These Books Today

They're brief, interesting and instructive. Kellastone is carried by lumber and building supply dealers. If your dealer cannot supply you, write us.

**The National Kellastone Co.**  
505 Association Bldg. Chicago, Ill.

PASTE THIS DOME  
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ON LETTERS YOU  
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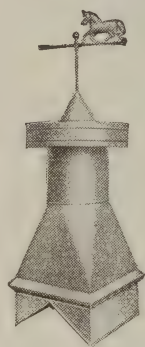
## Wheeler Safety Scaffold Brackets

In Position

Fold Compactly

**Save Lumber-Save Labor-Save Nails-Save Accidents**

Pay for themselves on two jobs. Last a lifetime. Lock automatically. Are rigid and firm when in place. Scaffold cannot swing. Men cannot be careless putting them up. Write for our **Free Trial Offer**.  
American Steel Scaffold Co., Dept. 4, Detroit, Michigan



## The GALE CUPOLA

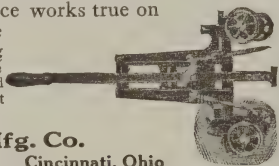
A perfect ventilating system that costs little and is suitable for all buildings. Not affected by storms or birds. Easily installed; no framing, just nail it on.

Other styles in catalog; get a copy.

**Galesburg Sheet Metal Works**  
142 So. Prairie St., Galesburg, Illinois

## An Opening for a Mortise Lock Can be Cut in Two Minutes by using the Miller Door Mortiser

Little labor is required, and a perfectly true job is assured. Makes no difference what thickness the doors are, the device works true on them all. Complete with five cutters, covering locks from  $\frac{1}{2}$  inch to  $1\frac{1}{2}$  inches thick. A real time and labor saver. Sent subject to trial.



**A. W. Miller Mfg. Co.**

Riverside, Calif.

Cincinnati, Ohio

Our Butt Mortiser and Rule Gauge for 75 cents. Postpaid

## GOODELL MITRE BOX

**Made of Steel—Cannot Break**



Send for New Circular E

**First in Quality & Improvements**

New STEEL BOTTOM PLATES with ANGULAR SERRATURES to prevent the work from slipping, and many other special features.

**GOODELL MFG. CO.,**

GREENFIELD - - MASSACHUSETTS

come in various styles at various prices and include chime clocks, cuckoo clocks, musical clocks, etc. They have a handsome circular which they send out. This illustrates the various dials and works and gives some mighty interesting information on clocks in general. It also tells considerable about the famous chimes and how they have been reproduced in the clock works.

You will naturally want to build a clock for yourself or as a gift for some one else. There is also the profit in selling a fine hand made clock and many idle hours can be turned to good advantage. Write the Clock Company for full particulars regarding their clock works.

### A Satisfactory Business.

The contractors who are not complaining of hard times will usually be found to have side lines in which they are making good money. This enables them to tide over hard times and dull times when others are hunting for something to do.

The proposition of the Norwalk Vault Co., 42 Seminary St., Norwalk, Ohio, as described on another page in this issue should appeal to the contractor who is not satisfied with the amount of work which he is doing or who finds that his income is not as much as he would like it to be. We understand that a number of our readers have already investigated and taken up the proposition of the Norwalk Vault Company and are immensely pleased with the results. As this is a territory proposition the first applicant usually gets this desirable business. Our readers are therefore urged to investigate and if their territory has not already been allotted to secure it for themselves.

### A Valuable Wall Board Suggestion.

The Heppes Company show a picture of a remodelled attic in their advertisement, illustrating how Utility Board may be used to add an extra room to any home at small cost.

The chief advantage of this suggestion, however, to the trade, lies in the fact that the Heppes Company tell more than how this effect can be obtained with Utility Board—they also tell how much the profit to the contractor is.

In this particular case the contractor's

Advertisers' Section

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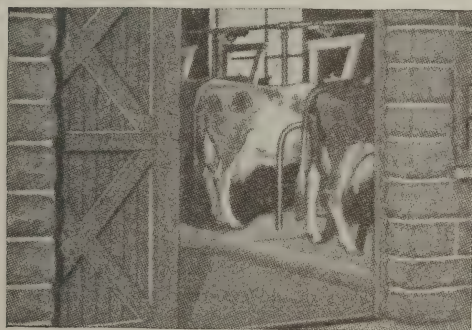


Built on a new principle—horizontal wood panels and steel ribs—correctly proportioned—beautiful skyline. Gives better service than other silos—sells easier.

## Carpenter Contractors Wanted To Erect Minneapolis Panel Silos

In one of the great dairy states, 50,000 silos were erected last year—a larger number than ever will be built *this* year. You can secure the work of erecting the Minneapolis Panel Silos in your locality and keep busy throughout the season. In addition to doing the work you can also make the *commission* on their sale. *We help you.* Write today for full particulars.

Puffer-Hubbard Mfg. Co., 3214 26th St. East, Minneapolis, Minn.



### Answering the Stable Question Right Means Bigger Profits for the Contractor and Builder

Every Mullins stable job is a good ad for the contractor who specifies and installs it.

Get our folder "Answering the Stable Question" now. Shows full line of stanchions, stalls, mangers, gates and feed fixtures and also Mullins Automatic Water System. All easiest to install by the contractor.

Mullins Mfg. Co. - Brillion, Wisc.



## DREW STALLS AND STANCHIONS

Are the World's Best

When you get a contract to build and equip a barn, equip it *right*. Recommend "DREW" Sectional Steel Stalls and Stanchions. Drew equipment contains special features found in no other line.

Drew Stall Frames adjust instantly without removing a single bolt, giving perfect alignment of cows on gutter; also special adjustment for different neck widths from calf to grown-up.

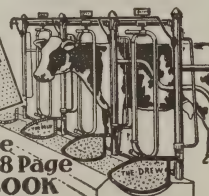
Instead of the usual cowstop, Drew stalls have one on each side, making doubly sure that cow cannot miss the stanchion; stops fold against partitions out of the way.

Don't accept the claim that other barn equipment is "just as good as the DREW;" find out! Write for new 48 page Drew Book. It's free, and you need it.

Send for the New Drew Book Now



Write For This 48 Page FREE BOOK



DREW CARRIER COMPANY

117 Monroe St., Waterloo, Wis.

Eastern Branch: Rome, New York



## SAND'S ALUMINUM LEVELS

### WILL NOT WARP

Sand's Aluminum Levels are light, strong and durable. They will not warp, split or rust. Nothing to work loose or get out of order. Easy to handle. Need no adjusting. Made in 18", 24" and 30" sizes for Carpenters and 42" length for Masons. We also make a high-grade line of wood levels.

are honestly made of very high-grade aluminum specially prepared for this purpose. The finish is ideal and the greatest strength is placed where most needed. All unnecessary weight is left out. The plumbs are the best that careful experience can make. Each level is fully tested before it is offered for sale. You can count on Sand's Levels being perfect.

### ASK YOUR HARDWARE DEALER

to show you Sand's Levels. If he does not sell them let us know, and we will send you a circular showing full size view of our 24" Aluminum Level and 1/2 view of the 30". Just like seeing the actual levels.

J. SAND & SON, 1023 Rivard St., Detroit, Mich.

### Best Level To Use In Dark Places

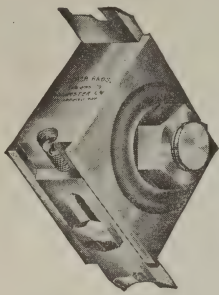
The plumbs at each end and the double center level make it readable in any position and at arm's length. Pick it up any way. It is always in position. Vials covered with heavy plate glass which keeps out water, dust and dirt. A Sand's Aluminum Level will last you a lifetime.

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## CUTTER HEAD

Designed to meet the needs of the carpenter and builder who wants to make his saw table do more work. Any shape knives made to order. Runs like a solid cutter.

Catalog No. 34 sent on request

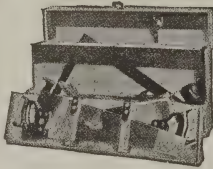
**Huthers Bros. Saw Mfg. Co.**  
1105 University Ave., Rochester, N. Y.

Patented December 30, 1913

## INDESTRUCTIBLE Carpenters' Tool Cases

Stronger than any wooden chest, much lighter, holds tools better, much easier to carry. Same shape as a suitcase when folded and carried like one.

Made of 3-ply veneer, covered with heavy canvas and painted. Edges and corners are bound and reinforced with steel. Two brass catches and locks. Contains a place for every tool. Two sizes—31 in. for 26 in. saws, 33 in. for 28 in. saws. Will last a lifetime. Write for booklet and prices now.



**WEDELL & BOERS**

157 Jefferson Avenue, DETROIT, MICH.



## Miller's Bungalow Plans

are used exclusively in our book, "Bungalows and Other Things," which contains photographs and floor plans of many artistic homes that can be built for \$1,500.00 up. Get this book, it is the best of its kind on the market. Pick out the house you want and we will furnish the plans and specifications for \$5.00 to \$15.00. The book is receiving high praise from contractors and builders.

Price \$1.00

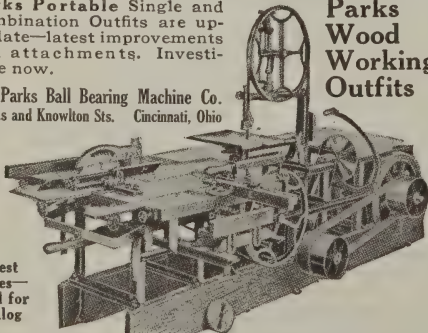
**Burd F. Miller Co.**

25 Brandeis, Omaha, Nebr.

**Parks Portable Single and Combination Outfits** are up-to-date—latest improvements and attachments. Investigate now.

The Parks Ball Bearing Machine Co.  
Fergus and Knowlton Sts. Cincinnati, Ohio

## Parks Wood Working Outfits



Lowest Prices—Send for Catalog

profit was \$22.00 for about two days' work. This striking example of extra money earned by the contractor is still more advantageous when it is considered that the work was done during stormy weather when ordinarily business is at a low ebb. Utility Board being impervious to the weather, can be laid with equal facility regardless of climatic conditions.

A number of enlarged reproductions of the illustration shown in their advertisement have been struck off by the Heppes Company engraving department and will be gladly sent to any contractor who writes for them. These reproductions will prove very helpful to the contractor who wishes to show a prospective user of Utility Board just how the finished job will look.

This is an example of real co-operation between the manufacturer and the contractor, which deserves more than passing mention. Every contractor should welcome the opportunity to obtain the picture mentioned and also the other valuable trade suggestions which the Heppes Company will give. We advise every reader to communicate with the Heppes Company, 4591 Fillmore St., Chicago, at once before the supply of these pictures is disposed of. There is no charge whatever, nor any obligation.

## A Suggestion for Saving.

One would not imagine that a little detail of knotting the sash cord would run into any money for the builder, or that he could make a saving, but when you consider that there is a possibility of saving several feet of cord on a standard sized



window besides half the time of knotting and installation and you have from ten windows up to handle on each building, that there is some real money to be saved.

The Allen-Sponsel Company, 197 Pearl Street, Hartford, Conn., have been at work

Advertisers' Section.

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# Have You Received Your Copy of “Louden Barn Plans?”

*It Is Stored With Prac-  
tical, Money - Saving  
Information Every  
Barn Builder Needs*

## The Service We Offer You

Louden barn plan service will help you build better barns. It will help you build them more economically. It will enable you to approach your client with plans to meet his individual needs. It will enable you to secure more barn contracts.

We make no charge for preliminary plans and suggestions, or for advisory service.

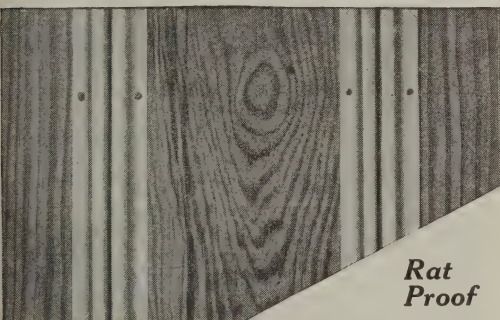
Write today for further information about  
Louden Barn Plan Service

## Our Book of Barn Plans

LOUDEN BARN PLANS contains the most valuable collection of practical barn plans ever published. Its 194 drawings and photographs illustrate practically every phase of modern barn construction; drainage, concrete work, strength of materials, lighting, ventilation, etc. The published price of LOUDEN BARN PLANS is \$1.00; it's free to you if you build barns.

You need this valuable book. Write for  
your copy today

**Louden Machinery Co., 5603 Fourth St., Fairfield, Iowa**



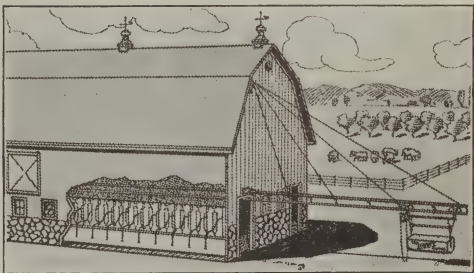
*Rat  
Proof*

# Metallic Batten Strips For Barn Siding

And other buildings where vertical siding is used. These Batten Strips expand and contract with siding; no warping, splitting or drawing off. Metallic Batten Strips make the building wind, rain and snow proof, always lay flat, do not interfere with sliding doors and add to the beauty of the building.

Write for prices and free samples

Metallic Batten Company, Department M, Owensville, Ind.  
Canadian Representative: Taylor Mfg. Co., Hamilton, Ont.



# ARCHITECTS AND BARN BUILDERS

Add to your profits by specifying and installing the Libbey Line of Barn Equipments. Also by securing our aid in planning out the most practical, up-to-date barn for each farmer's needs.

Libbey service and equipment will help you get contracts for barn building right in your locality—contracts that pay.

Farmers need modern, sanitary barns; you need the business; we need your help in selling our modern barn equipment. Let's get together.

Information on what we can do for you—and what you can do for yourself—will be sent on receipt of postal card.

**C. A. LIBBEY COMPANY**  
182 Marion Street Oshkosh, Wisconsin

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WRITE TO ADVERTISERS. IT HELPS.





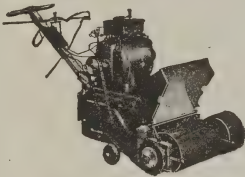
No Contract too Large  
for Capacity of

## THE NORTHWESTERN TERRA COTTA CO.

Nor too Small to Receive  
Proper Attention

Office and Works:  
2525 CLYBOURN AVE., CHICAGO, ILL.

### The AUTOMATIC BALLBEARING ELECTRIC Floor Surfacing Machine



Patented Oct. 15, 1912.  
Made in several sizes.

It will save you money  
by rapidly finishing  
your new or old floors  
just the way you want  
them. Self-propelling  
—you simply guide.

Write today for book-  
let telling all about the ma-  
chine, our free trial offer and  
list of users near you.

**WAYVELL CHAPPELL & COMPANY**  
Phone Ravenswood 4143

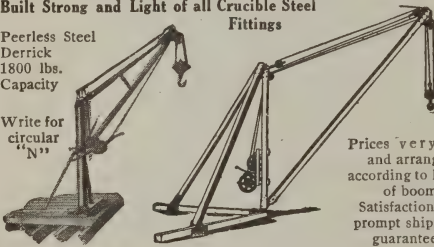
Dept. C, 4845 E. Ravenswood Ave., Chicago, Illinois

### Introducing the New Sasgen 1 Ton Portable Stiff Legged Derrick

Built Strong and Light of all Crucible Steel  
Fittings

Peerless Steel  
Derrick  
1800 lbs.  
Capacity

Write for  
circular  
"N"



Prices very low  
and arranged  
according to length  
of boom.  
Satisfaction and  
prompt shipment  
guaranteed.

Sasgen Derrick Co., 2053-57 N. Racine Ave., Chicago  
Canada Office: 1 Wabash Ave., Toronto

## FREE TRIAL Rapid Floor Surfacer

Made in  
Several Sizes

**M. L. Schluter**

225 W. Illinois St.  
CHICAGO



for years and have just perfected the Bull Dog Sash Cord Fastener, which is copper plated, costs very little and can be used on windows with great economy over the old style of tying cord to the sash weight and also fastening the loose end of the cord. This of course, applies to sash chain also and you do not need different sizes or styles for any cord or chain for the Bull Dog Fastener will take a large or small cord or chain equally well.

A sample box containing eight Holders with complete directions for its installation will be sent parcel post prepaid to any reader of the NATIONAL BUILDER, free of charge, and the Company feels certain that once you have tried these, that you will use nothing else.

### Zinc-Clad Shingle Nails.

Many of our subscribers will be pleased to learn that the W. H. Maze Company, of Peru, Illinois, manufacture what are known as Zinc-Clad Shingle Nails, besides their line of Pure Zinc (Zinc City) Nails and other products. These Zinc-Clad Nails have a base of genuine Iron and are heavily coated with pure zinc by the hot dip process. The manufacturers are specialists in the making of Rustless Shingle Nails and



their claim that Zinc-Clad Nails are the very best article obtainable at the price should have some weight with our readers.

For the convenience and protection of those who use Zinc-Clad Nails the manufacturers put them up in modern, trade-marked sanitary cartons.

Advertisers' Section.

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**SEND 10c in stamps for Catalog T 40**  
on Exterior and Interior Columns, or  
for our beautiful Pergola Album T 28,  
illustrating pergolas, garages, lattice  
fences, veranda treatments and garden  
accessories.

**HARTMANN-SANDERS COMPANY**  
Exclusive Manufacturers of

**KOLL'S  
LOCK  
STAVE**



**PATENT  
JOINT  
COLUMNS**

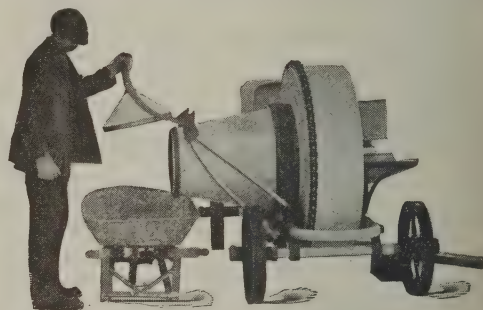
**2155-87 Elston Avenue - Chicago, Illinois**  
New York Office: 6 East 39th Street

Some time ago the Pennsylvania State College (Department of Forestry) purchased some Zinc-Clad Nails for testing purposes and Professor R. R. Chaffee, of this institution, advises that he has made chemical tests as to their lasting qualities, and further states that the Zinc-Clad Nails are far superior to the ordinary Galvanized Nails. He also says "I am warranted in saying that the Maze Co. are using the very best process possible in making these nails."

### High Efficiency Mixers.

Machinery is or should be merely an amplification of hand work. Laboratory experiments are merely machine operations on a small scale.

Mixing concrete by hand consists of thoroughly mixing the sand and cement adding the aggregate, drenching with water and



The Olsen Double Drum Mixer.

thoroughly mixing again. Likewise, this is exactly the process followed in the Olsen Double Drum Batch Mixer, made by the Olsen Concrete Machinery Co., Elkhorn, Wis. This mixer consists of a double drum in one of which the materials are thoroughly mixed dry, before any water is added. The Mixer automatically passes to the second drum and a proportion of water is added and a thorough mix results.

A feature of the Olsen Double Drum Mixer is in its charging which can be done from an ordinary wheel-barrow raised only a few inches from the ground. The discharge can likewise be made into a wheel-barrow without the use of hoists or other complicated machinery.

The Olsen Double Drum Batch Mixer is the result of careful study of both the chemical and mechanical actions of mixing. The double principle follows the best lab-

Advertisers' Section.



**New Plans  
for Homes**

Residences \$1,000 to \$6,000  
Cottages \$1,000 to \$3,000  
Bungalows \$500 to \$2,500  
All in one book, \$1.00

Your copy of this book of plans will be sent promptly for \$1.00, check or stamps. I will credit the \$1.00 on your first order for plans. Complete blue print drawings, working details, specifications, and list of material at reasonable prices. (Also plans from your own ideas.)

**JENS C. PETERSEN, Architect**  
820 State Bank Bldg., Traverse City, Mich.

**Agents Wanted**  
*Reliable Carpenters, Builders and  
Material Men*

**To Make Big Money**  
taking orders for our made-to-measure "Fly  
Screens and Screen Doors" for dwellings and porches.

**Write for Our Agency Proposition**  
Standard Shoulder Strip Method makes the wire  
drum tight and firm; cannot sag or pull away.

**Standard Screen Co., 1848-58 Hastings St., Chicago**



**Make money faster and  
easier than you ever did**  
before, by handling W. & C.  
Metal Shingles. We have a special  
selling proposition to make to one live man in  
every town in the country, and its acceptance  
puts the acceptor in a position to make a great  
deal of money very easily.

**Walter's and Cooper's Metal Shingles**  
are proof against fire, wind, storm, snow, rain, lightning, rust and  
decay; will not curl, check, split, rot, crack, blow or drop off, and are  
long lasting. Cost no more than wood shingles. Ask for catalog  
and selling plan.

**National Sheet Metal Roofing Co., 339-345 Grand St., Jersey City, N. J.**

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# 3 50c Business Books \$1

## ROOF FRAMING

The expert methods employed by some of the cleverest Carpenters and Builders

## Estimator's and Contractor's Guide

Presenting Most Modern Methods for Pricing Builders' Work

Information worth dollars in value to the practical Builder and Carpenter

## Architectural Drawing Lessons

for  
Carpenters and Builders

Valuable instructions designed especially for Carpenters and Builders who wish to make their own plans and designs

## What Our Readers Say

### One Subscriber Says:

"These articles on Estimating are the best I ever read. Why don't you put them all together? They would make a fine book."

### Another Subscriber Wrote:

"I have gotten more real good out of your series of Architectural Drawing Lessons than I could tell you. They are surely fine, and should be published together in a separate volume."

### Still Another Stated:

"I have learned to make plans and to practically build houses from reading the articles in The National Builder."

### And a Fourth Said:

"Your roof framing articles have taught me more uses of the steel square, and other practical things, than any book I have ever read. I would certainly like to have them all together in one volume."

WE have had so many flattering letters on our series of articles in the National Builder on these three subjects, that we have gone to great expense and trouble to combine them all in three small volumes, and can offer them to you at a greatly reduced price—one for 50c—**three for \$1.00.**

These books are the same size as the National Builder and each contains 48 pages of important information fully illustrated. Substantially bound in handsome paper covers.

Fill out and send the coupon below; don't wait because this offer may not be continued.

## The National Builder, 537 S. Dearborn St., Chicago

*This Coupon and a One Dollar Bill Will Bring You All Three Books*

THE NATIONAL BUILDER,  
537 S. Dearborn St., Chicago

Gentlemen:—Enclosed please find One Dollar, for which send me the three books advertised in The National Builder for March.

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

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## Stock Shades Are Not Good Enough

for YOUR clients; give them something better. Install special made-to-order shades in the houses you build—and have built. The wearing qualities are greater—the appearance is superior.

Give us the measure and we will make shades to fit, using the highest quality shade cloth mounted on guaranteed rollers. You install the shades, get the credit and pocket the profit. Investigate!

**S. A. Maxwell & Co.**  
3636 Iron Street, Chicago, Ill.



New York

Kansas City

oratory practice and consequently gives the best field results.

The Olsen Double Batch Drum Mixer was designed by a man familiar with building operations and labor conditions. It is therefore, saving in labor as well as time, it being roughly estimated that the cost of mixing by machine is about one-fifth that of mixing by hand.

For those who have made a study of building conditions and who wish to see how others have solved vexing problems, the Olsen Concrete Mch. Co., have prepared a booklet "Why the Double Drum"



The Concrete for This House Was Mixed in an Olsen Double Drum Mixer.

## Thurman Vacuum Cleaners

*Stationary and Portable*

For Residences, Hotels, Office Buildings, Etc.

70 Different Types and Sizes

Residential (built in the house) Stationary Plants from \$150.00 up. Our Engineering Department is at your disposal to lay out your pipe line gratis. Write for free booklet.



**Thurman Vacuum Cleaner Company**  
(Originators Vacuum Cleaning Machinery)

Dept. F. Eleventh & Monroe Sts., St. Louis, Mo.

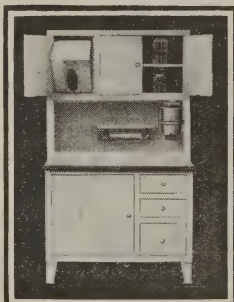
## BUILD YOUR OWN GRANDFATHER'S CLOCK

*With Our Help*

We furnish blue prints, finishing material and instructions. Buy the works, dial weights and pendulum from us at surprisingly low prices. You make a fine profit building artistic clocks for your friends.

Complete works, \$5.00. Others with chimes at all prices. Ask for attractive free offer.

**CLOCK COMPANY**  
1657 Ruffer St., Philadelphia, Pa.



## White House All Steel Kitchen Cabinet No. 1

Price \$46.00

Floorspace 24x39 inches. Height 68 inches. Special introductory price.

Write for catalog showing many styles and sizes.

The Faultless Iron Co. : : St. Charles, Illinois

which is of exceeding interest. One will readily see why the general principles are correct and will wonder why someone did not recognize these principles sooner. The booklet will further allow the contractor to determine which size will do his work to the best advantage and give him information which will be worth dollars either in pursuing his present work or in going after new work where the highest grade of workmanship is required.

## Ventilation.

While every one is agreed that ventilation is absolutely necessary a great many have not taken the trouble to carefully study the subject. Those who have, however, find that the most satisfactory way to ventilate farm buildings, factories, stores, theaters, etc., is by means of metal ventilators placed in the roof or high portions of the building.

The Royal Ventilator Company, 410 Locust St., Philadelphia, Pa., have been designed to operate properly under all conditions. They are made in a variety of styles to meet different requirements although all

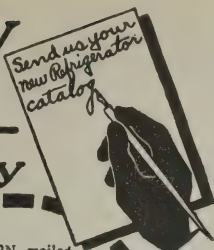
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# Just Say This — on a Post- Card - Today

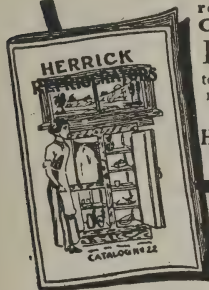


YOU need our new catalog No. 22N, mailed free on request. You need it in order to get the best refrigerator for your own home, and to be able to specify or recommend a refrigerator that will always give satisfaction for the other homes or hotels, stores and clubs, etc. you are building. You will add to your reputation as an architect, contractor or builder by specifying Herrick Refrigerators, for they never fail to keep foods wholesomely fresh. Herrick Refrigerators are fine looking—long wearing—very saving on ice and reasonable in price.

We specialize in residence refrigerators equipped for OUTSIDE ICING PLANS and SPECIFICATIONS for outside icing refrigerators—together with detailed information regarding the complete Herrick line will be sent on request. Write now.

Herrick Refrigerator Company  
Waterloo, Iowa

**-We'll Send You  
FREE This Handsome  
3-Color, 76-Page Catalog**



## Straight Talks on Durametal Weatherstrips

¶ You contractors, carpenters and building owners—why not buy weatherstrips direct from the manufacturer and do your own installing?

¶ By our unique plan we have cut out the usual big selling expenses, which enable you to buy direct from us, make a profit on the strip and good money on the installation, besides.

¶ Durametal Weatherstrips have been successfully sold for over 10 years and have stood every possible test. Their durability and simplicity makes them superior to all others.

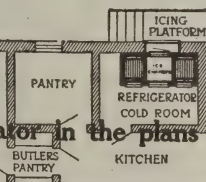
¶ Made of best heavy zinc, and fully guaranteed. Write for samples and prices now, before you turn another page. There's money in this for YOU.

*A few agencies open to responsible  
live local contractors and  
carpenters*

*Durametal Weatherstrip Co.*

14 East Austin Ave., CHICAGO, ILL

DINING ROOM  
**Put the refrigerator in the plans**



## Specify a McCray

Then you will go a long way toward solving the "service end" of the new home. You will delight your clients with the convenience of arrangement and satisfaction by giving them the very newest and best in scientific refrigeration. No matter how elaborate a mansion or how modest a cottage there is a

## McCray Refrigerator

either in stock sizes or built-to-order, that can be made a part of the house and arranged for outside icing. The outside door for icing keeps the iceman and his muddy feet away from the kitchen and saves the housewife lots of work and worry. In the cold weather no ice is needed.

The opal glass or porcelain linings are sanitary and easy to clean. All the foods are kept fresh and cool and free from spoiling. All odors and impurities are carried away through the water sealed drain pipe.

McCray Refrigerators are used wherever perfect refrigeration is demanded—U. S. Pure Food Laboratories, the U. S. Senate Restaurant, U. S. Hospitals and many other Government institutions. For thirty years the McCray has been used in the finest residences, hotels, clubs and public institutions, etc.

## Plan Service Free to Architects

We maintain a complete draughting department, and employ practical draughtsmen, thoroughly trained in the principles of correct refrigeration. These men are at your service and will co-operate with you and furnish blue-print specifications and estimates without charge. Send us your floor plans for suggestions regarding arrangement of refrigerator.

### GET THESE CATALOGS FOR YOUR FILES

No. 92—Regular Sizes for Residences. No. 73—For Florists. No. 50—For Hotels, Clubs, Institutions.  
No. A.H.—Built-to-Order for Residences. No. 69—For Grocers. No. 61—For Meat Markets.

**MCCRAY REFRIGERATOR CO., 748 Lake Street, Kendallville, Indiana**  
NEW YORK: McCray Building, 7-9 West 30th Street — CHICAGO: 1000 South Michigan Avenue

For branch salesrooms in other cities, see your local telephone directory -

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of them act upon the same scientific principles. A booklet which the Royal Ventilator Company have just issued shows their design, construction, installation, etc., and gives a long list of a few of the buildings on which they have been used. Considerable scientific data is also included as well as sizes, weights, prices, etc. The booklet, which is sent to our readers on request, will be of interest and value.

### Co-operation With Carpenters.

Many manufacturers of building materials are glad to get the co-operation of carpenters and contractors in specifying and putting in their materials. But in spite of this co-operation, after getting a material specified and put in the job, re-orders fail to appear. Sometimes the carpenter and contractor blames the material or else he believes it is the manufacturers' fault.

The trouble, however, may not be in either the material or in the co-operation the manufacturer gives. It is often in the way the carpenter and contractor installs the material. Sometimes a building man in

investigating the material that he is in a way familiar with will remark "Oh, I know how to put that in anywhere." The facts are, though, this particular material may be different from the material he has been using. Therefore, unless he is properly instructed by the manufacturer, he does not do a good job in the new material.

The Duramet Weatherstrip Co., state that they know how to show the readers of the NATIONAL BUILDER the proper way to install their weatherstripping and can do so by correspondence too.

They insist that any man who takes up their weatherstripping proposition shall first know how to do the right kind of installing. One poorly installed job of weatherstripping is enough to queer the very best material in any town and satisfactory installation will land others.

To make it easy for carpenters and contractors to get the Weatherstrip business, the Duramet Company issue a book entitled "Directions for Installing Duramet Weatherstrips." This book is only given to carpenters and contractors who are cus-

Advertisers' Section

## MAKE FURNITURE LIKE THIS



### Shown in the Photograph

ONE of our readers, who is strictly an amateur with tools, experienced no difficulty in making and finishing every piece of furniture, with the exception of the piano, shown in the accompanying picture. It is impossible in a small space to display all the different designs in Mission Furniture which we have published, but this picture shows something of the variety of pieces and how well they go together. The

## MISSION FURNITURE SERIES of 3 Volumes

Comprises 98 Attractive Designs, all different

**MISSION FURNITURE, Part 1**  
New Enlarged Edition 128 Pages, 30 Designs  
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Recently Issued 128 Pages, 32 Designs  
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New Book—Just Out 128 Pages, 36 Designs

Cloth, Size 5x7 inches **Price 50 Cents** Per Vol., Postpaid

### HODGSON BOOK COMPANY

537 S. Dearborn Street

CHICAGO

THESE books describe how to make furniture for every room in the house as well as swings for porch and lawn. Whether you need a complete set or only some special article to fill in with here and there, you will find full directions, dimensions and working drawings for making it in these books. The instructions are easy to follow and even the amateur can obtain most satisfactory results as related above. A complete list of the designs in each book will be furnished free upon request.

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# Asbestos "Century" Shingles



Residence  
San Antonio, Texas



Hotel  
Sulphur Springs, Ark.



Bungalow  
San Juan, Porto Rico

## The Artificial Roofing Slate that Outlives the Building in Any Climate in the World

IT IS one of the peculiarities about American building conditions that any contractor anywhere is likely to be called on at any time to construct anything from a shed to a manufacturing plant, or exclusive private residence.

With the use of Asbestos "Century" Shingles increasing 35% every year, the contractor who wishes to hold the leading business of his community finds it more imperative than ever to learn all there is to know about these reinforced concrete shingles—and to be in position to supply them.

It is especially important to remember that the original roofing slates are the Asbestos "Century" Shingles—

That only these shingles are or can be made by the patented "Century" process, assuring even reinforcement and uniformity of texture—

And that Asbestos "Century" Shingles give a durability, a freedom from repairs and upkeep charges not found in a like degree in any other roofing material either artificial or natural.

If you are not actively in touch with the Asbestos "Century" Shingle proposition write us for terms and trade prices.

**Keasbey & Mattison Co., Factors**  
Dept. H, Ambler, Penna.

*Branch Offices in Principal Cities of the United States*



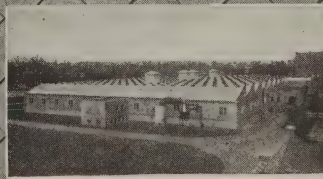
Mining Camp  
Red Ash, W. Va.



Stable  
New Port, R.I.



School  
Charleston, Ill.



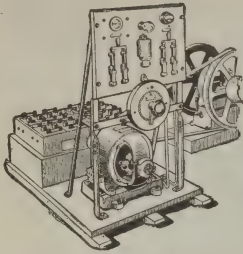
Industrial Plant  
Newark, N. J.

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## A Complete Electric Lighting Plant For \$175.50

Easily installed—no toy—lights 30 lamps. Dynamo, switchboard, storage batteries, belt, silent running gas engine, famous Mazda lamps—nothing complicated—takes up little room and less attention. *Be up-to-date and investigate this offer.*

Isolated Electric Plant Co., 66½ W. 106th St., New York

## Estimators' Price Book and Pocket Companion

By I. P. HICKS

Second Edition, revised and enlarged. Over 180 pages. A guide to prices of all kinds of building materials, with handy rules, tables and miscellaneous information for the estimator.

PRICE, POSTPAID, \$1.00

Hodgson Book Co., 537 South Dearborn St. CHICAGO, ILLINOIS



The Recessed Steel Medicine Cabinet

## Hess MEDICINE SANITARY Locker CABINET

### The Only Modern, Sanitary STEEL Medicine Cabinet

or locker finished in snow-white, baked everlasting enamel, inside and out. Beautiful beveled mirror door. Nickel plate brass trimmings. Steel or glass shelves.

**Costs Less Than Wood**

Never warps, shrinks, nor swells. Dust and vermin proof, easily cleaned.

**Should Be In Every Bath Room**

Four styles—four sizes. To recess in wall or to hang outside. Send for illustrated circular.

HESS, 907 L. Tacoma Bldg., Chicago. Makers of Steel Furnaces. Free Booklet.

Standard and Special Designs in Interior and Exterior Ornaments

In Plaster, Cement and Composition



Send us your blue prints for fine residence, theater and other public building work. Beautiful designs; best workmanship. Unusually low prices.

**Architectural Supply Co.**

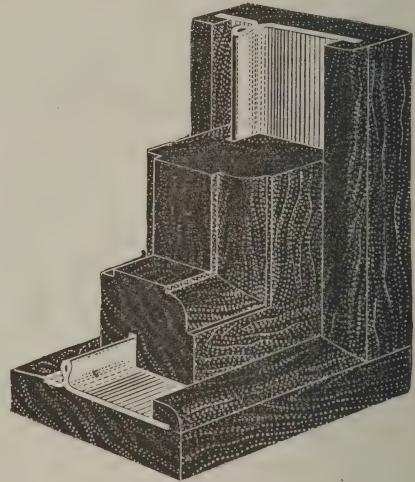
Harry A. Lang, Prop.

420 High Street Fort Wayne, Indiana

tomers of the Durametal Weatherstrip Co.

This Durametal Weatherstrip instruction book is so clearly written and illustrated that it is easily understood by men who have never specified or installed metal weatherstripping. It shows that putting in weatherstripping is a business in itself, that being a special business, it takes special instructions and special tools to do satisfactory work. These special tools, such as a saw router, grooving plane, etc., are Durametal Specialty Tools and are manufactured only for this Company.

While this book of instructions is not sent out until the carpenter or contractor takes up the selling proposition offered, the Durametal Weatherstrip Co., 14 E. Austin Ave.,



Durametal Weatherstrip Fitted to Side and Sill of Window.

Chicago, Ill., issue a booklet fully describing what that proposition is. They state that their method of co-operating with carpenters and contractors for installing their Durametal Weatherstripping is a proven success both for their customers and for themselves. They want to tell the readers of this paper about it and the catalog will be mailed on request to those interested.

## January Building.

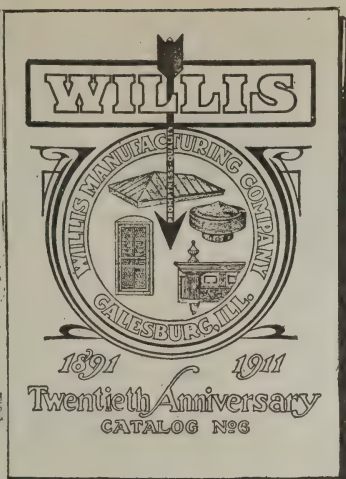
Building construction in the principal cities of the United States for January shows a decrease of 26 per cent in comparison with the corresponding month a year ago. Permits were taken out in 107 cities according to official reports to *Construction News* for the construction of 13,343 build-

Advertisers' Section.

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## The Architectural Sheet Metal Hand Book

**T**HIS book is your buying guide to every kind of metal work used in building construction.

Between its two covers are 180 large pages of information of particular interest to every progressive builder.

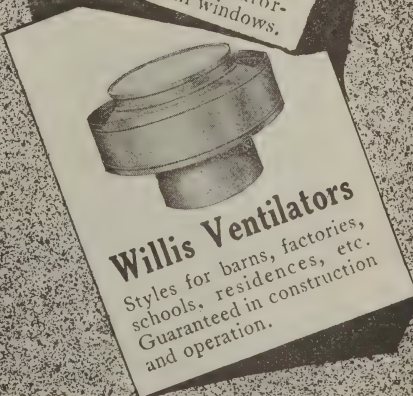
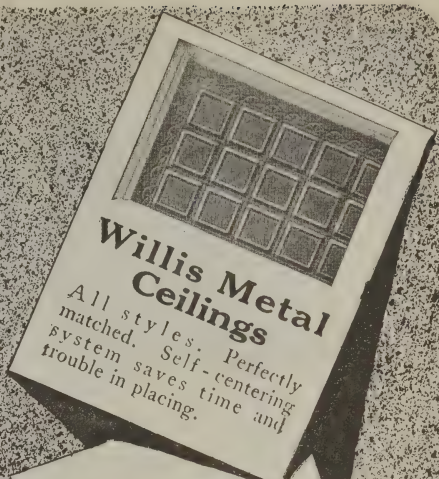
Whatever you want—"if it's made of metal and used in building"—WILLIS can furnish it *promptly* and at the *lowest market prices*.

There are *many* good reasons why you should buy from WILLIS. For one thing, it is *convenient*, as it saves you ordering from several individual manufacturers. A second reason is that we carry large stocks and can make immediate shipments. Our central location assures low freight rates to any point in the country. Our extensive business enables us to do business on a small margin of profit, permitting us to sell at low prices. And—

*In our quarter century's experience we have learned to sell only products of established quality. Our age and reputation is evidence that our policy of absolute satisfaction to customers is the right one.*

Write for a copy of our catalog today, and special information on any product you are interested in

**Willis Manufacturing Co.**  
Galesburg, Illinois



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From  
living  
room



Here is just that touch of up-to-dateness needed to make your houses easier to rent and sell.

A ready-to-install outfit of

## Western Electric Inter-phones

containing two hand set type intercommunicating telephones will save stair-climbing and calling from floor to floor.

Send \$15 by cheque or money order to Dept. 25-BL. An outfit will be sent by parcel post.

## Western Electric Company

Manufacturers of the 8,000,000 "Bell" Telephones

New York	Atlanta	Chicago	Kansas City	San Francisco
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Boston	New Orleans	Cleveland	Minneapolis	Seattle
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St. Louis	Dallas	Denver	Salt Lake City	

EQUIPMENT FOR EVERY ELECTRICAL NEED  
Member Society for Electrical Development. "Do it Electrically"



To  
kitchen

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Suited to Any Climate

Our books give photos—plans—costs



"Representative California Homes"

50 Ideal Plans—\$1600 to \$6000—Price 50c

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SPECIAL OFFER—All 3 books for \$1.00—Postpaid

E. W. STILLWELL & CO., Architects  
4383 Henne Building Los Angeles, California

This window which is equipped with

## PULLMAN ALL METAL WEATHER STRIP

is one of several hundred. The man who contracted to install the complete order made a profit of a dollar and a quarter on each window. YOU can get into this profitable business by being our agent.

We protect you by giving exclusive territory

Pullman is the best

The demand has been created. If you are a live one, sell and install

## PULLMAN STRIP

You buy the strip direct from us at factory price and make the big profits.

Write today for samples.

Pullman Metal Weather Strip Co.  
Agency Dept. - York, Penna.

## Be An Agent for a Rule Every Carpenter and Builder Needs

Improved Interlocking Fool-proof **Master Slide Rule** gives inside as well as outside measurements of doors, windows and everything else instantly and accurately. Strongly made, rust-proof and designed to last many years.

Price 15c per foot, in sizes from 4 to 8 foot lengths. Order a trial rule.

Anyhow learn about our agency proposition. Circular B tells.

DAHL MANUFACTURING CO.  
51B East 42nd Street New York City

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Note the Deep Cup in the Nailing Button and Extra Long Bead.



Quick Nailing and an apparently Seamless Job.

Patent Pending

## TWO NEW FEATURES

**"Classik"**  
STEEL CEILINGS

### Never Slip Nailing Point

A deep cup in each button guides the nail to proper location, also positively prevents nail from slipping while nailing.

### Extra Long Bead

The bead is made extra long in shape of half oval, fitting snugly over underlapping bead making a tight and perfect fitting joint, no tamping or calking required. *Write us about them today.*

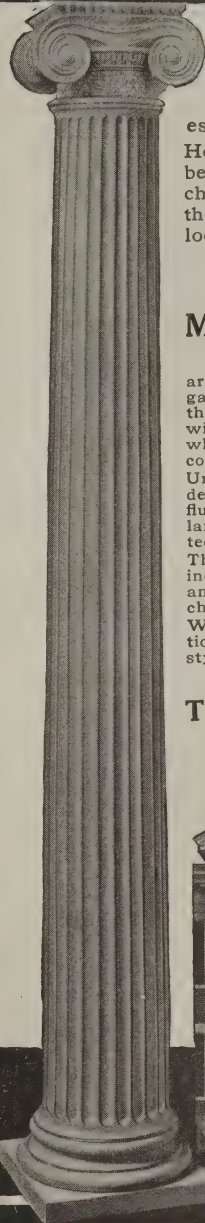
**The Berger Mfg. Co., Canton, Ohio**

For the best service address nearest branch:

New York	Boston	Philadelphia	Chicago
St. Louis	Minneapolis	San Francisco	

Export Department, 11th Ave. and 22nd St., New York, N. Y.

# The Center of the Picture



ON ANY building where columns are used they are the first thing to catch the eye and the longest remembered.

How important that they should be of material that will not check, split, rot, warp or open at the joints and thus spoil the looks of the entire job.

## UNION METAL COLUMNS

"THE ONES THAT LAST A LIFETIME"

are of open hearth steel specially galvanized — a sufficient guarantee that they will never mar the building with unsightly cracks and crevices which are bound to show up in wood columns.

Union Metal Columns are correct in design — with entasis and stopped flutes — conforming in every particular to the classical orders of architecture.

They are made in all sizes up to 40 inches in diameter and 35 feet high and there are ten artistic designs to choose from.

Write for folder showing installations, construction and various styles.

See Sweet's Catalog for Data

**The Union Metal Mfg. Co.**  
Canton, Ohio



# Last A Lifetime

CORTRIGHT Metal Shingles cost no more than good wood shingles, yet they last a lifetime, are rain and storm-proof, wind-tight, fire-resisting, and add greatly to the appearance of any structure, from the modest dwelling to the most ornate public buildings.

Wood shingles are short lived, they warp, crack, split, curl up or blow away; quickly catch fire from sparks and every few years must be replaced at great bother and expense.

## Cortright Metal Shingles

on the other hand have been in successful use for almost thirty years, and many roofs put on twenty and twenty-five years ago are as good as new today.

An ordinary workman can lay Cortright Shingles, even right over the old shingles, if desired.

If you are not already familiar with this modern roofing and with the profits Cortright Metal Shingles are making for contractors and builders handling them, write for full information today.

Cortright Metal Roofing Co., Philadelphia and Chicago



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# "Cabinet-Making"



By J. H. RUDD  
For the Practical Maker of Furniture,  
the Manual Training Teacher and  
the Ambitious Student.

J. H. Rudd, as a teacher of cabinet-making, has recognized the problems of the American furniture worker, and presents their solution in a terse, inimitable style that will appeal to every devotee of the art, whether in the factory or in the school-room. The work is not elemental, yet so arranged that its application to the trade requires small technical understanding. It has come to be recognized as a text book in the university of the trade—a simple, concise explanation of those difficulties in manufacture that every furniture artisan inevitably meets. With its chapters on Cost Accounting, by Mr. C. A. Zuppann, and Construction of Fuming Boxes, by Mr. Walter K. Schmidt, it embraces fully the entire process of manufacture from factory planning, estimating and costing to the construction of various types of panelling.

Post-Paid, \$1.50

Address  
**Hodgson Book Company**  
539 South Dearborn Street  
Chicago, Illinois

ings at an estimated cost of \$40,689,893 for the month just closed, as against 15,806 buildings involving a total cost of \$55,307,053 for the same month a year ago, a decrease of 2,463 buildings and \$14,617,160 or 26 per cent. The most satisfactory feature of the situation is the fact that there are marked indications of improvement in New York City, there being an increase in the month just closed of 76 per cent over the same month a year ago. The greatest activity in building outside of the largest cities is in New England, New Jersey and Ohio. The figures in detail are as follows:

Cities.	1915		1914	
	No. of Estimated Bldgs.	Cost.	No. of Estimated Bldgs.	Cost.
New York (Boros Man. and Bronx) .....	438	\$10,273,384	640	\$ 5,829,394
Chicago .....	476	4,327,900	523	4,784,300
Boston .....	242	2,408,000	341	6,652,000
Brooklyn .....	395	1,534,450	720	2,459,290
Detroit .....	322	1,217,290	403	2,629,260
Cleveland .....	486	1,116,080	557	1,298,260
St. Louis, Mo. ....	332	1,094,673	486	854,132
San Francisco .....	505	1,006,043	398	7,349,812
Philadelphia .....	657	910,805	865	1,247,985
Los Angeles .....	722	860,360	855	1,182,246
Schenectady .....	239	827,650	15	34,205
St. Paul .....	91	699,258	111	514,312
Toledo .....	105	537,297	125	234,894
Minneapolis .....	208	485,100	261	504,505
Baltimore .....	254	480,095	264	1,796,351
Washington, D. C. .	249	470,328	268	461,760
Pittsburgh .....	138	465,461	145	1,171,037
Cincinnati .....	702	451,350	1,029	580,910
Seattle .....	683	408,585	634	1,206,580
Buffalo .....	190	381,000	187	536,000
Portland, Ore. ....	342	378,040	503	444,600
Albany .....	160	340,290	109	149,065
Newark, N. J. ....	117	339,803	134	350,806
Hoboken .....	11	330,885	12	63,480
Oakland, Cal. ....	204	291,859	226	267,859
San Diego .....	150	288,895	250	365,085
Louisville .....	74	277,420	153	303,280
Indianapolis .....	194	266,907	291	481,850
Springfield, Mass. .	74	266,005	54	162,520
Rochester .....	124	246,717	134	354,320
Milwaukee .....	75	203,649	136	471,858
Denver .....	164	177,635	200	229,320
Cedar Rapids .....	17	168,000	50	384,650
Omaha .....	45	165,075	79	180,440
Richmond, Va. ....	78	159,840	128	233,536
Savannah, Ga. ....	43	152,750	56	180,025
New Orleans .....	...	146,909	...	204,051
Hartford .....	47	139,265	58	256,887
Saginaw .....	20	133,794	27	20,050
New Haven .....	68	132,155	60	264,320
Norfolk, Va. ....	54	119,864	54	120,765
Memphis .....	116	101,953	225	361,390
Troy .....	42	100,014	14	19,345
Bridgeport .....	42	98,110	58	127,295
Spokane .....	14	92,185	34	34,045
Salt Lake City .....	47	85,650	34	121,850
Columbus .....	39	85,100	122	178,740
Berkeley .....	69	83,750	53	59,750
Elizabeth .....	26	82,314	21	47,872
Grand Rapids .....	73	80,072	81	341,240
Worcester .....	87	77,276	74	580,184
New Bedford .....	49	75,560	71	368,964
Pasadena, Cal. ....	116	74,779	123	128,807
Faterson .....	41	73,895	27	29,941
Youngstown .....	31	73,250	45	69,367
Birmingham .....	205	72,178	285	250,230
Lincoln, Neb. ....	17	70,135	19	76,150
Springfield, Ill. ....	10	69,400	11	29,410
Evansville, Ind. ....	34	69,050	58	70,236
Erie .....	49	66,509	43	60,772
Tampa .....	124	66,112	135	181,240
Superior, Wis. ....	35	65,830	21	30,775
Quincy, Mass. ....	41	59,605	38	66,835
Tacom, .....	99	59,598	116	109,153
Nashville .....	116	58,037	50	102,269
Akron .....	46	52,635	98	138,150

Advertisers' Section

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## ORNAMENTAL AND ENDURING Mullins' Metal Tile Roofing

Is ornamental, as well as weather-defying. With proper care it is everlasting. Its first cost is almost its last cost. It is the one Metal Tile Roofing that is faultless, as all drawbacks from expansion and contraction, have been eliminated. It is simple in construction, and when put on according to directions, is guaranteed for years.

We also manufacture stock and special designs in Cornices, Building Fronts, Garlands, Modillions, Enriched Moldings, Capitals, Finials, Tympanum Panels, Faces and Sheet Metal Statuary. Also Ornamental Metal Stampings for Cornices and Fireproof Windows. Special discounts to the trade.

Write for Catalog

**THE W. H. MULLINS CO.**  
210 Franklin St., Salem, Ohio, U. S. A.



## We Want a Man!

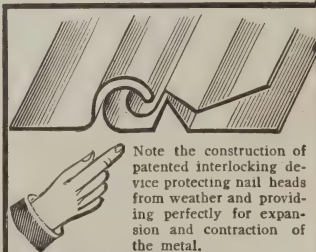
Our business is booming! We must have a good live agent in every community to demonstrate, take orders for and apply our Metal Spanish Tile Roofing. To the right kind of man we will pay a very liberal commission.

## Build Yourself a Business

Here is a chance to build up an independent, profitable business for yourself right at home. Many of our agents are now devoting their entire time to selling our metal roofing. Others have made big profits simply devoting part of their time to selling and laying our Metal Spanish Tile.

## Edwards' Metal Spanish Tile

Architects are specifying Edwards' Metal Spanish Tile, for they know it will do away with roofing "troubles." Builders like it because of the finished appearance it gives any house on which it is used.



Note the construction of patented interlocking device protecting nail heads from weather and providing perfectly for expansion and contraction of the metal.

## Write For Territory

It's going to be a case of "first come, first served" with favors to no special one. Right now the territory is being snapped up. Don't wait.

One day's delay may mean that some one else will be given your territory. Don't delay; write today for new roofing catalog and special agent's proposition.

## The Edwards Mfg. Co.

"The Sheet Metal Folks"

430-450 Eggleston Ave., Cincinnati, Ohio

The World's Largest Metal Roofing, Metal Shingle and Metal Ceiling Manufacturers



## Before Laying Any Roofing Job This Spring Investigate Con-Ser-Tex

It's weather-proof. It is easy to lay. It never rots or stretches. It hugs the roof or roof surface tightly. It makes a handsomer roof than wooden shingles, slate or tile, and is more economical. The scientific chemical treatment of CON-SER-TEX makes it practically proof against deterioration. It gives lasting protection under all conditions of weather and climate.

Write for sample and complete information

William L. Barrell Co., 8 Thomas Street, New York

Chicago Distributor: Geo. B. Carpenter & Co., 430-40 Wells St.

California Distributors:

Waterhouse & Price Co., The Pacific Building Material Co.,  
Los Angeles San Francisco

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Des Moines.....	24	52,250	24	38,400
Lawrence, Mass..	10	48,375	12	20,850
Brockton.....	23	48,275	24	95,640
Niagara Falls....	17	44,825	23	71,350
Montgomery, Ala.	28	40,635	32	38,880
Binghamton, N. Y.	67	39,994	50	89,597
Scranton.....	32	38,170	44	101,925
Bayonne.....	12	38,000	7	20,574
Trenton.....	68	36,812	37	47,118
Kansas City,				
Kan.....	48	35,690	53	57,870
Fort Wayne.....	18	35,100	18	35,350
New Britain, Ct..		35,095		27,215
Wilkes-Barre.....	55	34,643	30	103,109
Wichita, Kans....	11	33,300	12	19,005
Canton, Ohio.....	22	31,175	11	11,200
Dayton.....	12	30,000	37	84,785
Chattanooga.....	128	29,142	163	55,170
Fitchburg, Mass..	8	25,250	4	6,700
Sioux City.....	16	24,950	38	70,125
San Jose.....	36	24,156	15	24,713
Stockton.....	39	24,040	44	22,425
East St. Louis,				
Ill.....	18	23,025	27	47,525
Altoona.....	10	22,255	18	19,922
Passaic.....	14	20,410	13	8,200
Woonsocket, R. I.	7	19,500	7	11,000
Topeka.....	18	18,270	30	63,010
Peoria.....	9	17,600	56	172,200
Haverhill, Mass..	10	15,400	8	40,300
Portland, Me.....	11	15,065	14	91,050
St. Joseph, Mo...	16	12,380	24	48,500
Auburn.....		10,600		1,850
Colorado Springs	21	7,665	18	36,495
Harrisburg, Pa..	7	7,575	11	28,750
Reading, Pa.....	9	5,900	12	414,975
Butte.....	8	3,980	10	10,250
Hamilton, Ohio...	7	3,621	22	20,639
Terre Haute.....	8	2,400	33	15,460
West Hoboken,				
N. J.....	5	1,860	5	5,550
Bay City.....	4	1,850	17	13,400
Totals .....	13,343	\$40,689,893	15,806	\$55,307,053

Laying Two Shingles at Once.

The Neponset Shingle, made by Bird & Son, 310 River St., E. Walpole, Mass., is unlike anything that has ever been manufactured before. It is entirely different from the so-called asphalt shingles because each Neponset Shingle is of a patented built-up construction. The heavy butt end is three times as thick as the other end and when the shingles are laid they form seven layers on the roof.

The same materials are used in making these shingles as are used in Neponset Paroid Roofing with which every owner of a farm building and every railroad or factory man is so familiar.

Paroid is the roofing which the United States Government has used so extensively —1,600,000 square feet at Panama alone.

In addition to the feature of having unusual durability the Neponset Shingle also has the advantage of ease of laying. It can be laid very quickly, and at much less cost than wooden shingles. This is due largely to the fact that it is made in pairs so that you lay two shingles at once. This is also due to the uniformity of the shingles. The carpenter does not have to stop and

trim each shingle to fit as each shingle is just right for the space. For that reason the shingles can be slapped down much quicker than wooden shingles and it requires one-third less nails.

This double form of shingle also decreases the number of joints between shingles. This means a better roof because there are fewer opportunities for leaks to occur.

With all these advantages the Neponset shingle is also architecturally beautiful. It has been specified by architects of high standing and is being used in the best kinds of residences. It is not in any sense of the word a freak shingle when laid on the roof but closely resembles slate.

Reliable Plumbs and Levels.

Catalog No. 10 issued by J Sand and Son, 1023 Rivard St., Detroit, Mich., describes their line of plain, brass bound, and aluminum levels and gives many reasons why they are better, more reliable and durable than similar instruments sometimes used.

A feature of the Sand's Level is that when one comes on the job it invariably means the purchase of others by the other carpenters, as they cannot see one of their mates using better and more modern tools than they have in their own kit. It is not unusual to find out of six or eight men on the job that every one uses a Sands Level. The aluminum style is particularly well liked by every one. This catalog will be sent to our readers on request and will allow them to select the particular style they like best and either order them through their dealer or purchase it direct.

The Anderson Rotary Mixer.

Bulletin No. 107 issued by the W. H. Anderson Tool & Supply Co., 20 Macomb St., Detroit, Mich., describes in considerable detail the Anderson Rotary Mixer as well as the number of concrete tools and accessories.

This Company has been in business some forty-four years and this has enabled them to gauge accurately the wants and requirements of contractors in tools, machinery and supplies. It would naturally be assumed therefore, that any mixers which the Anderson Company recommended would have points of advantage to the Con-

# Wanted—the right sort of man

## One that can make good on a new proposition—can you recommend him?

HERE is an opportunity for one man—and only ONE. As soon as another man takes it, you lose it! What we are looking for is not a man out of a job; but a man who wants to get out of a job and start a business. Nor do we want men who have failed in other lines of work; but men who have already succeeded and are after still greater success.

WE want the best—not necessarily the biggest contractor and builder in your neighborhood. \$5,000 to \$10,000 a year earnings must not be beyond his ambitions. But he must be prepared to work, to overcome obstacles and able to judge a new proposition on its merits. Furthermore, he must be willing to back his own judgment by investing from \$150 to \$5,000 in his equipment.

ON this investment he should, after a few months of good preliminary work, earn not less than 10% a month profit, which rate should not only remain steady, but steadily increase. A man out in Michigan—to take a striking example—piled up nearly 2,000% profit in six years. Our proposition is neither a theory nor an experiment, but a tried out and tremendously profitable manufacturing line for a practical man with imagination and enterprise enough to crave something bigger than the rather crowded opportunities to be found in the practical building line.

ON the other hand, the Norwalk proposition is neither a "sure thing" nor a get-rich-quick game. For the man willing to work hard enough and invest money enough to get a fair start, it will give bigger and more certain returns than any other legitimate business we ever heard of. This is all we claim—and this we can prove. If you are interested let us give you more details—you may investigate and check up to your heart's content.

OUR eight years experience have shown that two kinds of men are most successful with the Norwalk Vault proposition:

- a—The man already doing well, whose business, however, is not developing rapidly enough to suit him or has slow seasons at one time or another.
- b—The man who wants to go into business for himself but has so far seen nothing really worth his while.

STARTED as a side line, it is more than likely some day to prove at least as important as your present business. A man in a little town on the Hudson, working nights and holidays in a cellar, paid up in a single year his original investment of \$450 and in the second year cleared 200% profit. Naturally, however, we would much rather hear from a man with capital enough to make the business a pleasure rather than a struggle. For it is just as easy—and lots more certain—to make as good a rate of profit on \$4,500 as on \$450.

THE Norwalk Vault business is still in its infancy. Not one man in ten knows now that he can provide for a departed wife or child an absolutely moistureproof, airtight burial vault as smooth and clean cut as your desk, yet solid as if hewn out of granite. Undertakers everywhere are waking up to the fearful crudeness of the old fashioned method of burying unprotected in the muddy bottom of a six foot cistern. As soon as the public begins to realize there is something better—and we are taking advertising steps to see that they do before long—the holders of the Norwalk Vault franchise for any given district will find they have a mighty valuable possession.

FOR the Norwalk Vault Company is, we believe, going to become one of the big business institutions of the country. We propose to unite several thousand local manufacturers all over the United States—each in his own

territory—into a sort of giant partnership. Then we propose making the idea of a cement burial case as thoroughly understood as the idea of a Pullman sleeping car, and the name "Norwalk Vault" as familiar as the name "Uneda Biscuit." The Norwalk Company has already a branch factory of its own in New York City; but the

United States is pretty big, and to cover even a small part of it with our own shops would take far too many years. There is, therefore, this opportunity for the right man to take over local manufacturing rights—and get in on the ground floor of what is to become one of the great manufacturing businesses of the country.



NOW suppose you arranged a sort of partnership with all your local undertakers—they to sell, you to manufacture for your locality. Figures from more than a hundred concerns in various parts of the country show the average manufacturing cost per vault to be considerably less than \$10. Nowhere in the country is one of the finished vaults sold to the undertaker for less than \$20 and in most cases they bring \$25 or \$30. All the selling—the direct retailing—is taken entirely off your hands by the undertaker who pays your wholesale price and makes for himself \$20 profit or more, according to his customer.

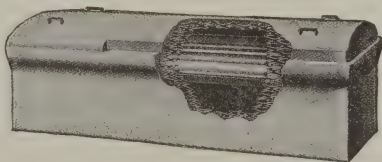
SUPPOSE you could ever reach the point where you made \$10 every time a funeral took place in your county. Wouldn't worry much about your income, would you? European wars, bad crops, hard times never affect the annual death rate.

AS you can see, there is a perfect gold mine of business on all sides—waiting—but this being a new and rather unusual proposition, it takes rather a good man to cash in. If you are the kind of man who has made good already or can make good, this may be your opportunity. No technical experience necessary; the equipment required is not expensive; any respectable shed may be converted into a factory; no high priced labor—the knack of making the vaults can easily be taught an unskilled laborer; no large sum tied up in machinery or materials—a few dollars at a time will keep the business running. Once established the business is not affected by hard times, no burdensome fixed charges—you can open up and shut down like an umbrella, according to your sales and collections.

THE amount of money required to start with, varies directly with the size of territory occupied. One man, for example, recently bought outright the entire state of Maine; another started at the same time on a royalty in a half-county in Ohio.

YOU may acquire your territory outright or we will share with you on a royalty basis. In either case—compared with the possible returns—the cash investment is ridiculously small.

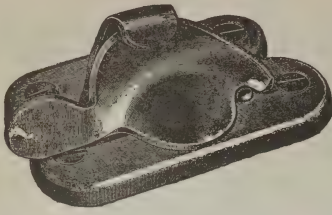
REMEMBER the Norwalk Vault is a trade marked article fully protected by patents. Eight years test has shown no weakness. More than 12,000 vaults have already been made, sold and used. Half of the good territory of the whole United States is already gone. And remember that every day—with each new round of advertising, with the opening of every new territory—comes a jump in values for those already in.



SO if the proposition appeals to you at all, don't pass it by because it is new; before it is much older someone else will take it. Let us prove it out for you. We will be glad to show you original letters, figures, maps, models, or to take you to the nearest local factory and let you see the vaults themselves. (We are so busy however, that we would greatly appreciate the favor of your not writing, unless you are in a position to talk real business in case you are thoroughly satisfied on every point.) If you think you might be interested, ask us anything you want to know.

**The Norwalk Vault Company, 42 Seminary Street, Norwalk, Ohio**





Antique  
Copper  
Finish  
Sash Lock  
No. 5493

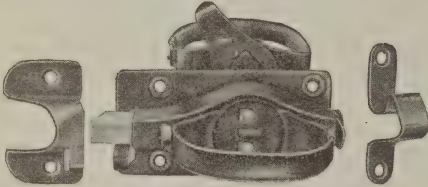
**40c**  
Per Doz.

Rehm's New Catalog is ready for you. Write now; it's free. Shows fine big line of builders' hardware, tools, etc.

We do not sell to contractors in Cook County, Illinois.

**REHM HARDWARE CO.**  
1503 Blue Island Ave. Chicago, Illinois

## Whitcomb Steel Barn Door Latch



Over 13,000 Dozen Sold Last Year

A strong, durable, convenient latch, adjustable to doors of any thickness; will not catch harness. Two large handles permit opening of doors from either side. Each latch provided with two catches to hold door open and closed. Also arranged for use of a padlock.

Albany Hardware Mfg. Co., Albany, Wis.



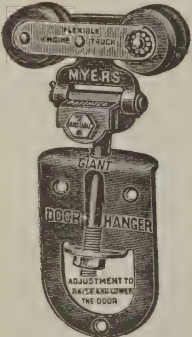
SUN-RED  
SELVAGE

## Rust-Proof Alumina

is a 10-coat electro-galvanized Window Screen Cloth—electrically applied after weaving. It is guaranteed to last from 2 to 5 times as long as any other Galvanized Cloth on the market.

We furnish Screen Makers and Mill people with free printed Folders for their trade. Write for free samples.

Reynolds Wire Co. - Dixon, Illinois



## MYERS GIANT

and New-Way  
Adjustable Tendem  
Door Hangers

PATENTED

For Tubular Girder Track

Are adjustable up or down, and in or out. Trolley Wheels are heavy turned steel, revolving on steel roller bearings, and run inside the tubular girder track. Not affected by rain, sleet or ice. Write for descriptive circulars and prices.

**F. E. MYERS & BRO.**  
ASHLAND, OHIO

tractor. This bulletin describes the mixer, which is made in a number of styles and sizes for various purposes, and will allow the contractor to select the one which fits his particular line of work.

## Seventy-five Years in Business.

Three generations of Disstons have administered the Company's affairs and given their entire time to the betterment of Disston Products. In many cases three generations of one family work side by side in the shop, a number of employees having been with the Company over fifty years.

The constant growth of this Company indicates that no pains have been spared to take advantage of every improvement in the line of material, processes, workmanship and attention to the particular requirements of their trade. It is gratifying to see that a company can thus keep before a discriminating public for this many years and show such a record of advancement. We anticipate that another seventy-five years will also see the Disston Company in the forefront of the American Tool Manufacturers.

## The Universal Reversible Ideal Hoist.

Simplicity in design and construction is the main feature in the Hoist made by the Universal Hoist & Mfg. Co., 615 State St., Cedar Falls, Ia. This Hoist enables the contractor to raise materials either in wheel-barrow loads or otherwise placed on the platform, at the minimum expense and with the greatest rapidity. Only those who have made a careful comparison of hoisting by modern method realize the saving possible by these means.

The Universal Hoist & Mfg. Co. will be glad to correspond with contractors and builders who have hoisting problems to solve and they believe that a number of them will be overcome by the use of their equipment.

## The Incomparable Five.

An advance circular from the Eureka Machine Co., 107 Handy St., Lansing, Mich., describes and illustrates the Eureka Batch Mixer No. 5, which has a capacity of about five cubic feet of material per batch. The Mixer is of the non-tilting type being easily loaded and discharged while run-

Advertisers' Section

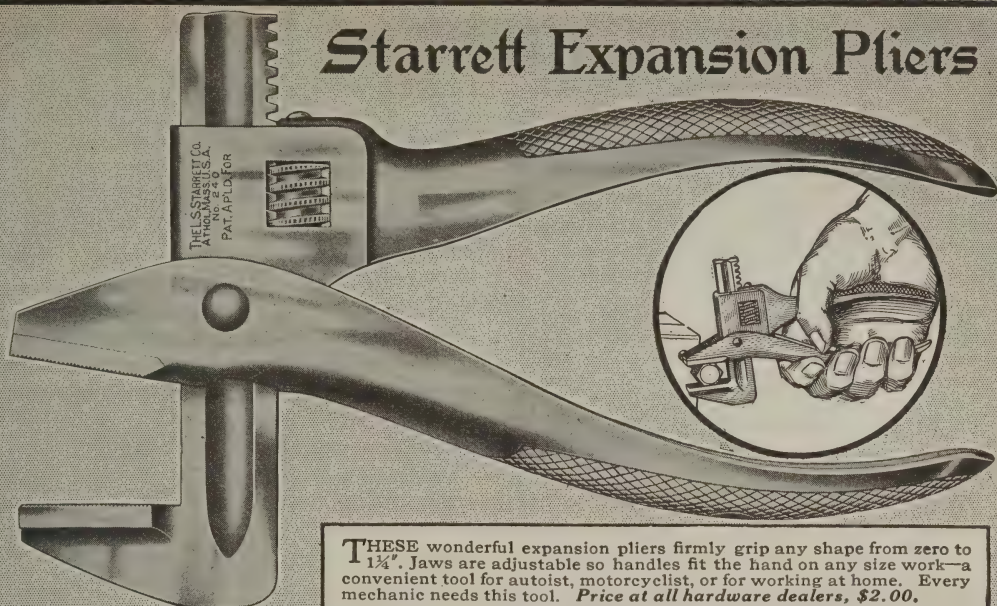
PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



# Starrett Expansion Pliers



THESE wonderful expansion pliers firmly grip any shape from zero to  $\frac{1}{4}$ ". Jaws are adjustable so handles fit the hand on any size work—a convenient tool for autoist, motorcyclist, or for working at home. Every mechanic needs this tool. **Price at all hardware dealers, \$2.00.**

Send for free catalog No. 20M.

42-423

The L. S. Starrett Co., Athol, Mass.  
World's Greatest Toolmakers

**SARGENT**

REG. U. S. PAT. OFF.

## WROUGHT STEEL BLOCK PLANES

Block Planes that cannot break, convenient for the pocket. Quick and easy adjustments.

If your dealer cannot supply you, we will send prepaid, on receipt of the price.

No. 5206—6-inch Nickel Plated Plane, \$1.00

No. 4206—6-inch Polished Plane, - 90 cents

**SARGENT & COMPANY,**

Makers of Planes, Squares and Mechanics' Tools

52 Water Street, New Haven, Conn.

For full description of Sargent Warranted Planes, send for the Sargent Plane Booklet.

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## Draw Perspectives —and Earn More Money

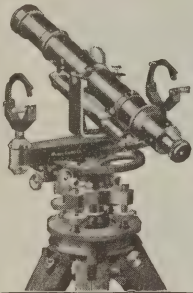


Building contractors able to make their own perspectives can increase their profits by effecting a valuable saving in time and money. We teach it *thoroughly*.

As a *business*, this work offers excellent opportunities—men earn big salaries. More offers of positions than graduates to fill them. Write for free prospectus.

**School of Applied Art**  
Dept. N. B. Battle Creek, Mich.

## “Sterling” Convertible Level



Designed and Made by

**Warren-Knight Co.**

This name on a level or transit means *accuracy, simplicity, durability, efficiency, satisfaction!*

Write today for illustrated folder and details of free trial offer and rental purchase plan.

*All makes of instruments repaired*

136 No. 12th St., Philadelphia

## Builders' Transit

No. 6187

An Ideal Instrument for *Architect, Contractor, Builder*. Constructed of the highest grade metals, with achromatic lenses, cross and stadia hairs, compass, full vertical circle. Guaranteed for accuracy, will positively hold adjustments.

A full line of levels, rods, tapes, etc., for Contractor or Engineer.

Large assortment of second-hand instruments in good working order; good bargains.

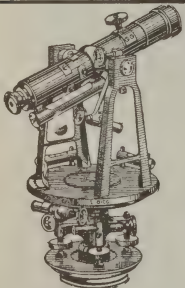
*Instrument repairing a specialty.* Best workmanship—lowest prices. Send your instrument to us for an estimate.

Catalogue 300 N. B. on Request

**F. WEBER & CO.**

St. Louis, Mo. PHILADELPHIA Baltimore, Md.

## Builder's Transit



For the builder or architect who wants to raise the standard of his work—who takes conspicuous pride in the accuracy of his efforts, this transit is especially designed. It is but one of the complete line of Beckmann quality instruments. Send for our complete free catalog.

**The L. Beckmann Co.**  
101 Adams St., Toledo, O.

**BECKMANN  
INSTRUMENTS**

ning. The Eureka Machine Company believe that this mixer represents the highest point in quality as well as appearance while keeping the cost to the lowest possible point consistent with the best material and workmanship.

More detailed information regarding this mixer can be obtained from the manufacturers direct who are anxious to hear from every contractor interested in concrete machinery.

## The “How” Book for Contractors.

This book issued by the Hunt-Helm-Feris Company, 340 Hunt St., Harvard, Ill., is not for sale at any price, but is designed for distribution to our readers free of cost. It contains a vast amount of valuable information on building subjects, something over one hundred pages being given to technical matter, tables, drawings, etc. There is a considerable amount of material on ventilating systems, as well as barn and stable equipments and data which the contractor and builder needs in his every day work.

The book will fit in the pocket and every one of our readers should have a copy for reference and study. Remember that it is free when the NATIONAL BUILDER is mentioned.

## Minneapolis Panel Silos.

The Puffer-Hubbard Mfg. Co., 3214 26th St., E., Minneapolis, Minn., state that in one of the great dairy states, 5,000 silos



Puffer-Hubbard Silos on a Modern Farm.

were erected last year—and they predict that even a larger number will be built in 1915.

No one is better fitted for silo work—and especially wood panel silo construction—

Advertisers' Section.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



# 10 Days' Free Trial!

**MR. BUILDER:**—You are daily in need of a good Level. It is absolutely necessary to your success. The day is past when anything but the most accurate work will be accepted by the up-to-date Architect and Owner. In these days of progress the Contractor and Builder who is equipped with time-saving and error-preventing instruments seriously handicaps the other fellow who isn't. Here is your opportunity to test a **White's Improved Level** for 10 days without paying a penny down. In other words you can try it before you buy it, without the slightest obligation to keep. When we ship you a **White** instrument on approval, it is with the strict understanding that it has a definite and distinct duty to perform "**on the job**" and must perform it too or we lose. Ask for your copy of our new free illustrated catalogue showing various styles of Levels and Transits at a wide range of prices, together with a special discount sheet and details of our **10 days' free trial offer**.

**DAVID WHITE COMPANY, Inc.**  
**420 E. Water Street Milwaukee, Wisconsin**

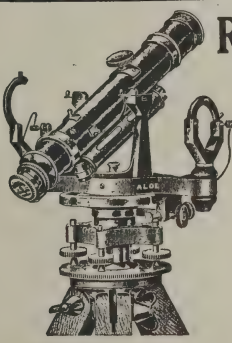
You can make your work neater and more durable and save time and money by using



## KEES Metal Building Corners

**NEATNESS**—Your work will be neater because the corners of the lap-siding will have the perfect mitre effect. After they are painted they are practically invisible.  
**DURABILITY**—Protected by the paint the metal corners will last as long as the house. The metal is especially treated to make the paint adhere. Moisture and dust cannot collect on or under them.  
**TIME-SAVING**—It is much easier and quicker to apply the metal corners than to accurately cut and fit siding and corner strips, far easier than to mitre the siding.  
**MONEY-SAVING**—It is more economical to use **KEES** metal corners because of the low first cost and the saving in high-priced labor.

Write today for free samples, prices and profit-making particulars. Goods made by **KEES** are made to please **FD.KEES MFG. CO. BEATRICE, NEB** Box 811



## Rent This Level 10 Months, Then It's Yours

**Builders — Contractors** — This is not the old style Architect's Level. It is the newest 1915 model **convertible** level. There is not a single Builder or Contractor who has not almost daily need for this instrument. For laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning shafting, walls, piers, etc., for getting angles, locating levels anywhere, ditching, laying streets and walks, running straight lines, and a hundred other uses.

### Instruction Book Free

Complete illustrated booklet telling how a builder or contractor can use the convertible level sent free on request.

### Send Coupon—No Obligation

Send the attached coupon today and we'll send illustrated booklet and complete details of how you can own the Aloe Convertible Level for 10 months' rent.

**A. S. Aloe Co., 613 Olive St., St. Louis, Mo.**

### Warning

The Level we offer is the Aloe Convertible Level. Don't confuse the Convertible Level with the ordinary old style Architect's Level. The only work that can be satisfactorily done with the ordinary Architect's Level is the determining of elevations. But the Convertible Level, besides its use as a level, is a modified "**Transit**" and broadens the use of the level 100 per cent. You can't afford to buy any but the Aloe Convertible Level.

### Half Century Reputation

We have been manufacturers of transits and levels since 1863 and our instruments are the standard of the world.

### Free Trial

We allow you to convince yourself by a trial of the instrument before you obligate yourself.

### The Rent Buys It

No large cash outlay needed. Just pay the monthly rent for a few months and the instrument automatically becomes your property.

### COUPON

A. S. Aloe Co.  
613 Olive St., St. Louis, Mo.

Please send free instruction book on the use of the Convertible Level and complete details of your rental plan. This request in no way obligates me.

Name .....  
Occupation .....  
Street .....  
City ..... State.....  
National Builder, March, 1915

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



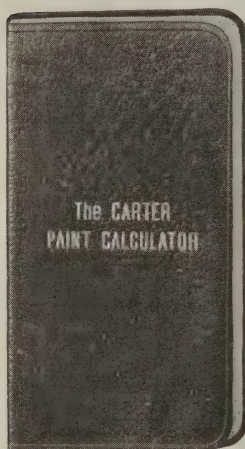
which is the kind of material used in the Minneapolis Panel silos made by the Puffer-Hubbard Mfg. Co., than the up to date carpenter or contractor located in the small cities. Therefore—this company is advertising for the purpose of making connections with men of this kind—who will sort of act as agents.

They not only help to secure work in this line for carpenters and contractors by their advertising—but have a liberal commission offer to work—which is worth writing for.

A catalog fully describing and illustrating the Minneapolis Panel silos will be sent on request.

### Helps for Painters.

One of the best little books we have seen for a long time is the "Carter Paint Calculator" published by the Carter White Lead Co.



The Carter Handbook.

This little vest pocket size book is neatly bound in leather and contains a fund of information that every contractor should have. It cannot help being of great value in estimating on painting jobs and in giving general painting information that you are always glad to have where you can reach it in a moment.

Two illustrations of the "Carter Paint Calculator" are shown here: one of the cover—a pebble grained black leather—the other a reproduction of two of the pages showing how to estimate a painting job.

There are other pages that deal with the covering capacity of paint, priming and finishing coats, etc. It is information such as will save many little mistakes that soon run into dollars. In the back of the book is a handy color card.

Besides this clever little book, the Carter White Lead Co. are sending out a number of color plates showing exterior and interior views of dwellings. These can be

used to advantage by the contractor in helping his customer choose the colors for the house. There is quite a portfolio of these color plates.

The Carter White Lead Co. maintain a department that is always ready to offer help and advice on any painting job. They charge nothing for this service and you may



DIMENSIONS	
Length 28 ft.	Width 18 ft.
Height at corners	16 "
Height of gables	8 "
Porch	7 x 10 "



DIMENSIONS	
Main Length 26 ft.	Width 18 ft.
Height at corners	18 "
Height at corners	Width 14 ft.
Height of gable	7 "
Porch	8 x 10 "
	5 x 5 "

AREA TO PAINT	
Sides	1472 sq. ft.
Gables	144 "
Porch Floor	112 "
Porch Ceiling	112 "
Porch Posts & Rail's	100 "
Overhang of eaves 1 ft	120 "
	2059 sq. ft.

White or light tinted paint required (1 gal. covers 350 sq. ft., 2 coats) 6 gal.  
Darker shades (400 sq. ft.) 8 gal.  
(Sash, Gutters & Chimney not inc.)

AREA TO PAINT	
Sides	2022 sq. ft.
Gable	49 "
Porch Floors	153 "
Porch, Trellis, etc.	300 "
Overhang of eaves 1 ft.	140 "
	2664 sq. ft.

White or light tinted paint required (1 gal. covers 350 sq. ft., two coats) - 8 gal.  
Darker shades (400 sq. ft.) 10 gal.  
(Sash, Gutters & Chimney not inc.)

Pages from the Carter Handbook.

be sure that their help is worth having when you run up against a snag. We suggest that you get a copy of the "Carter Paint Calculator" and the color plate portfolio by writing the Carter White Lead Co., West Pullman Sta., B., Chicago, Ill. Do it today before it slips your mind.

### Mission Stains and Wax Finishes.

Modern furniture and trim requires different treatment in finishing than that of earlier periods. A proper stain with suitable wax finish will give the results sought for by both the amateur and professional decorator. The Stickley Bros. Co., Grand Rapids, Mich., have prepared a great variety of these finishes for different woods and for different effects. The circulars showing the various colors and color schemes will be sent to our readers on request and will introduce to them the Stickley method of co-operation.

### The Ideal Contractor's Hoist.

The Original Gas Engine Company, Kal-amazoo St., E., Lansing, Michigan, have placed on the market the Ideal Single Drum One Way Direct Connected Contractors' Hoist. To those who are familiar with hoisting apparatus this Hoist will be of interest as it will enable the contractor to do

# From Dinner Pail to Drafting Table



One year ago a young man in an Iowa town was working as a machinist's helper at \$1.75 a day. Now he is a Draftsman in the offices of a large manufacturing concern at a salary of \$1200.00 a year. The American School of Correspondence trained him for this position.



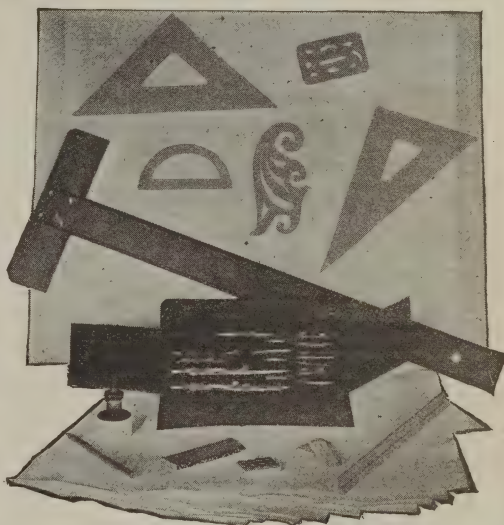
Here is your opportunity to get the training you need to hold down a similar job and earn big money—\$100.00 to \$250.00 per month paid to expert draftsmen. Our easy, practical method will teach you **ARCHITECTURAL DRAFTING, STRUCTURAL DRAFTING or MECHANICAL DRAFTING** in a few months. You will receive **expert individual instruction** in the course you select. All drafting instruments and materials supplied absolutely at cost. Also big four volume Cyclopedia of Drawing sent free if you enroll now. Drafting is the foundation of all engineering professions. Prepare yourself for a real man's work. This special offer is made by the greatest non-resident educational institution in the world—a school whose guarantee is backed by seventeen years of successful teaching by correspondence. Just sign and mail the coupon.

## Library Free

A \$20.00 Cyclopedia of Drawing is included absolutely free in this special limited offer. Four big volumes as illustrated below. The only work which thoroughly covers **MECHANICAL, STRUCTURAL and ARCHITECTURAL DRAFTING**. Worth many times \$20.00 to any drafting student. Not only will you receive the best expert instruction, but you will have these books handy for reference at all times—they will answer all your questions authoritatively and promptly. Just think of it—four big volumes bound in half red morocco, gold stamped, 1,720 pages, 7x10 inches, 1,037 illustrations, page plates, diagrams, designs, etc., furnished free, if you enroll now under this special limited offer.

## Drafting Outfit at Cost

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**American School**  
of Correspondence. Chicago. U.S.A.



## FREE OFFER COUPON

A. S. of C.

Gentlemen:—Please send me full information about the course checked below, also further particulars regarding the drafting outfit furnished at cost and the library included FREE with this course.

- ....Mechanical Drafting
- ....Structural Drafting
- ....Architectural Drafting

N.B 3-15

NAME.....

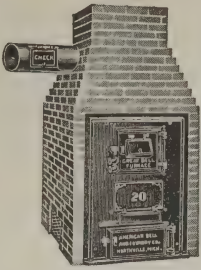
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## A Hot Air Furnace

you ought to know about. Costs no more than a base burner, heats twice as much on about the same amount of fuel. No pipes, no lost heat. Brick or portable. Write and learn.

**American Bell & Foundry Co.**  
Northville, Michigan

a vast amount of miscellaneous work such as carrying up bricks, mortar and various other building material.

A feature of this Hoist consists in the clutch which is so arranged that the outfit can be used without other attachments for pile driving and similar work.

The Original Gas Engine Co., will be glad to hear from Contractors and Readers who have difficult equipment problems to solve as they believe that with their experience they can give the contractor much valuable and disinterested advice.

## How Can You Increase Your Business This Year?

You get some Good Ideas by Reading this Article.

One of our leading financial writers has made this startling statement—"Drive your business during 1915, or you will be driven out."

It is practically up to every one of us to get busier in stirring up business than we have been ever before. Real business lies



Morgan Mirror Door; a Convenient Addition to the Hall or Bed Room.

around everywhere if we only get a hustle on and go after it. If you simply go to a man and say—"Give me some business"—we doubt that you will get it. It is necessary to put a thought in the other man's

Advertisers' Section.

THE ROCK OF AGES CLEFT FOR YOU

RED GREEN  
**SHELDON'S**  
PURPLE BLACK  
**SLATE**

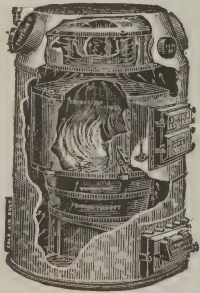
THE ROOF FOR AGES ALWAYS NEW

Artificial substitutes bring endless expense for upkeep. Post a postal and get posted.

**F. C. Sheldon Slate Co., Granville, N. Y.**

Saved by buying a  
**\$50 BOVEE ECONOMY FURNACE \$50**

At Manufacturer's Prices



Has a large combustion chamber. Saves one third of the fuel. Has perfect

**Ventilating System**

**The Most Perfect Hot Air Plant Sold**

Send pencil sketch of floor plan for our manufacturer's price and illustrated catalog.

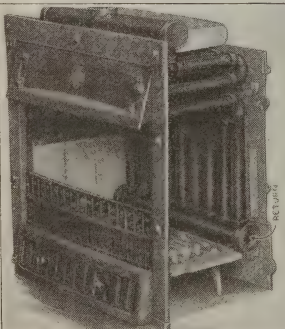
**Bovee Furnace Works**  
60 8th Street Waterloo, Iowa

## Hot Water Heating From the Fireplace

Cut shows section of our Heating Coil which if placed in any fireplace will heat six times the amount of space without additional cost of fuel and affords the same healthful ventilation. Will suit any fireplace or mantel. Write for descriptive circular.

**Heitland Grate & Mantle Co.**

No. 128 N. Fifth Street  
Quincy - Illinois



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# Diamond Expansion Bolts

For fastening all kinds of material  
to brick, stone or concrete—

**Quickly  
Securely  
Positively**



**"They Hold as Long  
as the Wall Lasts."**

**Diamond Expansion Bolt Co.**  
90 West Street - New York

# Hot-Water Heating



**How Contractors Can Make Money by the  
ANDREWS SYSTEM**

There is no nicer heating proposition for contractors than Andrews offers. We do all the work of estimating on your preliminary work, then build the plant complete in our shop and ship it ready to be screwed together by any man handy with tools. Full money-back guarantee is given with each job. In over thirteen years we have sold systems in over 2200 cities and towns of this country. For old as well as new houses.

## Andrews Steel Boilers

Built of plate steel like power boilers. Double the fire travel found in cast iron boilers; larger fire pot and combustion chamber; easier to clean. Burn any grade fuel and less of it. Unlike all other residence boilers.



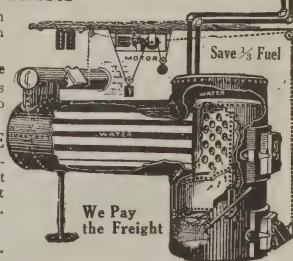
## Sewage Disposal For Suburban and Other Districts

Perfectly sanitary, as it employs nature's own method, bacteria. No chemicals used. All season service. Requires no attention.

**All Ready to Connect Up. Lasts as Long as House**  
Easier to install than a cesspool. Lasts as long as house. A fine, satisfactory line for contractors to handle. Special booklet free.

**Big Book on Heating and Sewage Disposal FREE**  
A book that is more than a catalog. Besides describing our full line of modernizing equipment, it gives a lot of valuable information on equipment that every contractor should have. Estimates free also.

**ANDREWS HEATING CO.**  
1464 Heating Bldg., Minneapolis, Minn.



# Asphalt Shingles Have Come to Stay

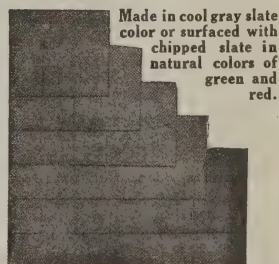
They have demonstrated their efficiency. The experimental stage is past. We are the pioneer manufacturers of

## ASPHALT SHINGLES

Made in colors, also Flat and Tapered. Buy the time tried.

**The Winthrop Asphalt Shingle Co.**

Factory: 102 61st St., Argo, Ill. Office: 1415 Association Bldg., Chicago



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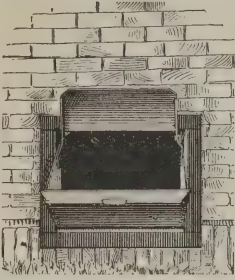


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## Kewanee All-Steel Coal Chutes

### Pay Profits



You, Mr. Contractor, can get this **PROFIT**, by installing Kewanee Chutes in your buildings.

Built entirely of steel—no cast iron nor glass to break or get out of order.

Automatic in action and easily installed in any building old or new.

Write for Special Proposition to Contractors

Kewanee Manufacturing Co.  
Kewanee - Illinois

mind that will make him *want* to give you business.

Suggestion is a powerful thing. It is also the best kind of salesmanship. When you suggest to a man to do this or that, you really stir up thoughts in his own brain and by and by he wants to do the thing that you suggested to him.

Every contractor should get into the above state of mind and add to it a dose of "do-it-now."

Every third house owner will require repair work, remodelling or new building this spring. Don't wait until they have made

up their minds definitely to do or not to do this or that. Get in early with some suggestions. Help them to make up their minds before the final decision. In this way you will be more likely to get the business.

There is many a man in your vicinity right now who needs a new front door, new flooring, a new shingled roof, a mirror door, roofing and building paper, screens for windows

and porches, porch rails and columns, etc. Make up a simple and attractive plan for a sleeping porch and suggest it to some of your prospects. These suggestions will bring business.

A successful contractor and builder is one who works with proper materials and finishes off the job in a workmanlike manner. This means good advertising.

An artistic front door or a mirror door added to the house makes a decided improvement. You will find that the Morgan Sash and Door Co. produce doors and mill-work with a care and finish that reflect credit on the contractor. Their factory equipment is the most modern and the workmen are woodworking experts.

The Morgan Sash & Door Co., Dept. A-22, Oshkosh, Wis., carry numerous stocks of standard designs as well as various unusual and artistic patterns that are universally liked. These people also have a shipping method that insures prompt de-

Advertisers' Section.



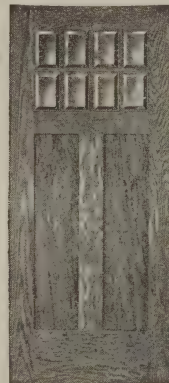
## The "BEST" Fuel Chute

The "BEST" Coal Chute is also a window, and can be made into a ventilator if desired. A heavy screen protects the glass when chute is open. Chute cannot be opened from outside. Also made with solid cast door. Three sizes. Easily installed in new and old buildings.

### THE BEST LINE

Outline of BUILDERS' HARDWARE will interest every builder. It includes Coal Chutes, Chimney Caps, Tops and Copings, Cleanout Doors, Cistern Covers, Stud Sockets, Foot Scrapers, Cesspools, Hog Waterers. Give us your dealer's name. Ask for descriptive circulars.

Sterling Foundry Co., 800 Wallace St., Sterling, Illinois



Craftsman B. An Artistic Front Door for the Bungalow.

## The Enterprise Coal and Fuel Shute

### The Easiest Installed

Non-Breakable—and Cheapest and Simplest Fuel Shute made. Cheapest because simplest.

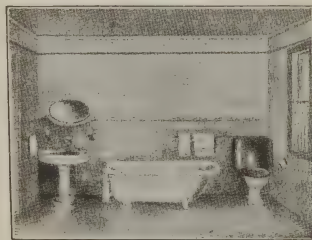
Only four pieces—Frame, Spout, Lock and Weight.

Roller bearing hinges; no exposed bolts to tamper with.

Positively no way to open it from the outside. All of cast iron—practically rustless.

Sent to any address on receipt of \$7.50. Write for Builders' and Dealers' Discount

Enterprise Iron Works  
Albert Lea, Minnesota



## FULL LINE of PLUMBING and HEATING SUPPLIES

Sold Direct at Wholesale Prices

**20% to 40% Saving**

Complete bathroom outfits, tubs, closets, lavatories, kitchen

sinks, etc. Prompt shipment from a complete stock. The only house selling up-to-date, guaranteed goods at wholesale direct. Write for illustrated catalogue and prices.

B. Y. Karol, 768-72 West Harrison St., Chicago, Ill.

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\$42<sup>25</sup>



**"GUARANTEED"**  
GRADE "A" PLUMBING  
HEATING SUPPLIES

COMPLETE  
AS SHOWN

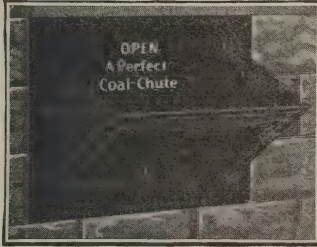
DIRECT  
TO YOU  
AT

**WHOLESALE PRICES**  
**J. HARDIN CO.**  
35 YEARS AT 47TH - AND COTTAGE GROVE AVE  
CHICAGO.

SEND FOR CAT. 31

Everything in **GUARANTEED PLUMBING and HEATING SUPPLIES at WHOLESALE**

Bathroom Outfits, Sinks, Pipe, Fittings, Valves, Faucets, Heating Boilers, Radiators, Water Pressure Systems and Lighting Plants for Country Homes, etc. Our \$200,000.00 plant behind our **GUARANTEE.** Send for complete Catalog No. 31.



OPEN  
A Perfect  
Coal Chute

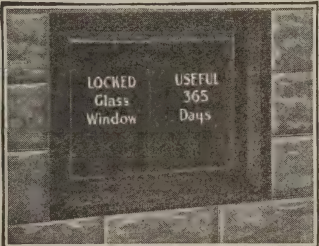
### If You Build, Buy, Own

Be up-to-date and have the world's best—

## The Window Chute

for your coal bin.

Thousands in use—  
The very Best.



LOCKED  
Glass Window

USEFUL  
365 Days

Write for Booklet "C."

**Holland Furnace Co., Holland, Mich.**  
*World's Largest Direct Installers of Furnaces.*


## GAS PLANTS for COUNTRY HOMES

EVERY suburban and country home, large and small, can have gas for lighting and cooking.

### MILBURN PLANTS

make gas which is better than city gas and costs no more. Machines are simple, automatic and durable. Write for Catalogue V-22.

The Alexander Milburn Co.  
Baltimore - Maryland



# Lorenzen

*As Usual* in the New **MORRISON**

**Chicago's Latest and Greatest Hotel**

Wherever tile and mosaic work was used in this famous new hostelry, the Lorenzen line was selected.

The walls and floors of the wonderful first floor grill with the attractive blue and white color scheme; throughout the kitchens; in the bathrooms—Lorenzen tiles and ceramic mosaics were used.

This job is only one of many where the Lorenzen line was selected for its distinctiveness and breadth.

Write today for "Tiles and Mosaics," describing our complete line for all sorts of work.

**Chas. F. Lorenzen & Co.**  
101 N. Clark St., Chicago



## WE GIVE CONTRACTORS



LEADER  
STEEL FURNACE

HESS  
WARNING  
VENT.  
CHICAGO  
FILES

better terms than we offer to any other class of buyers of Hess Furnaces. Our heaters are not offered to dealers, but are sold direct to contractors and consumers. We give contractors a special discount, and also a Profit Sharing allowance for information concerning building operations which they can give us without taking time or trouble.

If you are a contractor ask us to let you know more about it. Very many contractors, all over the United States, are installing our furnaces, and their repeated orders indicate the satisfaction and profit they receive.

**Hess Warming & Ventilating Company**  
907 Tacoma Building Chicago, Illinois

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## Contractors Get More Contracts—Builders Save Architect's Big Fees

By using our complete working blue prints and specifications which are guaranteed satisfactory or money back.



**Send for Our Free 1915 Booklet**

showing plans and elevations of buildings costing from \$2,000 to \$4,000.

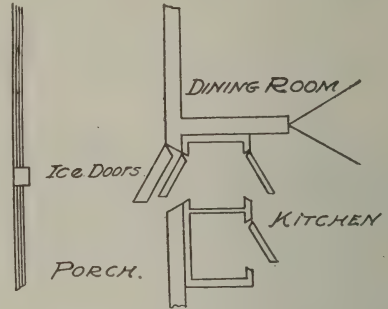
**Complete Plans and Specifications as Low as \$3.00 Per Set**

The Bungalow Specialists, 2148 So. Kedzie Av., Chicago

livery in good condition. The Morgan Door book that will prove beyond question that a Morgan Door is a "Door Beautiful," for either new work or when remodelling.

### Handsome Catalog for Your File.

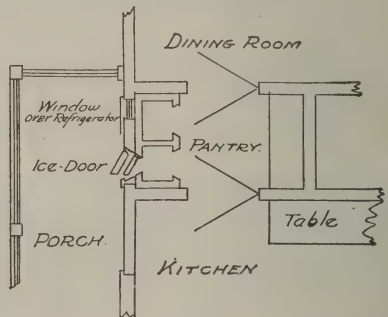
There has just come to our desk one of the neatest catalogs we have seen for some time. The cover is beautifully embossed



in colors and the design is most pleasing and appropriate.

A good refrigerator is a joy to the housewife. And what woman can resist buying a well designed, ice-saving refrigerator that is sanitary in every way, well made, and sold at a very low price? In fact catalogue 23N of the Herriek Refrigerator Co. before us, is all the sales argument a contractor needs. Show it to the home builder and it makes its own sale.

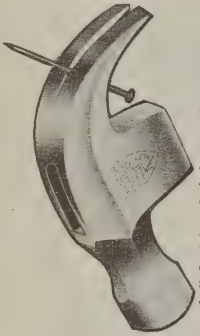
You will find it a source of additional profit to install refrigerators in the homes



you build. And now when outside icing is in such high favor, the catalog of Herriek Refrigerators will come in handy. There are four pages of blue prints giving details for outside icing and specifications for the use of both back icing and end icing styles.

Advertisers' Section.

## A Lifetime of Hammer Service



is guaranteed when you buy a "vandro" Vanadium Nail Hammer. The "vandro" will draw anything from a headless brad to a spike. Drop forged from Vanadium steel—proof-tempered in oil—positive "bite"—perfect "balance"—hand shaved Hickory handle—heads simply cannot fly off.

No. 21½ Standard, 16 oz. No. 22 Gen'l Purpose, 13 oz. No. 22½ Finishing, 10 oz. No. 721½ Ripping, 16 oz. Your choice of either for \$7.00 and your dealer's name. Don't wait but order now.

**VAN DOREN MFG. CO., Inc.**  
(Vandro Dept.) Chicago Heights, Ill.

## Webster's New International

Every day in your talk and reading, at home, on the street car, in the office, shop and school you likely question the meaning of some new word. This New Creation answers all kinds of questions with final authority.

**More than 400,000 Words. 6,000 Illustrations. 2,700 Pages. Cost \$400.00. New Divided Page.**

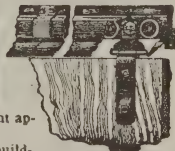
**India-Paper Edition:** On thin, opaque, strong, imported India paper. One half the thickness and weight of the Regular Edition.

**Regular Edition:** On strong book paper. Weight 14¼ lbs. Size 12½ x 9¾ x 5 inches.

**Write for specimen pages of both Editions**

**G. & C. MERRIAM CO., Springfield, Mass., U. S. A.**

## WAGNER EVER-TIGHT TROLLEY TRACK



—the new track that has met with instant approval of builders and owners.

No brackets—track is forced up tight to building by lag screws. No chance for rain or snow to drive in between track and building. Completely protects hangers and top of door. Nothing else like it on the market—nothing so near to trolley track perfection. Absolutely bird-proof Impossible for door to come off.

**Write for Circular**

showing the important features of **Wagner Door Hangers and Trolley Tracks**. Ask your dealer for Wagner Door Hangers and Tracks. If not at your dealer's we will fill your order direct.

**Wagner Mfg. Co.**

Department E

Cedar Falls, Iowa

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# This Builders' Hoist Will Save 25 Cents


on every 1,000 brick  
you lay!

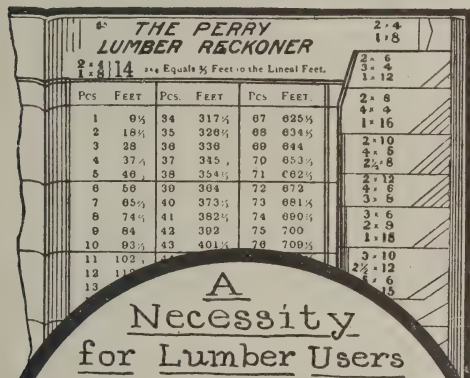
The biggest time and labor saver in the field. Does away with hod and wheelbarrow expenses. Speeds up construction work, cuts down costs. Operates by hand, horse or engine power. Built sturdy and reliable for the hardest kind of service. Inquire today for descriptive literature, prices, etc.

## Territorial Agents Wanted

Build a profitable business by recommending and taking orders for these hoists in your locality. Our agency offer to Contractors, Dealers, Supply Houses, etc., is important; write for details.

**H. B. Sackett Screen & Chute Co.**  
1689 Elston Ave., Chicago  
199 Medford Street, Charlestown, Mass.





**THE PERRY LUMBER RECKONER**  
1: 114 1/4 Equals 3/4 Feet to the Lineal Feet.

Pcs	FEET	Pcs.	FEET	Pcs.	FEET
1	0 3/4	34	317 1/4	67	625 1/4
2	1 1/2	35	328 1/2	68	634 1/2
3	2 1/4	36	339	69	644
4	3 1/4	37	345 1/2	70	653 1/2
5	4 1/4	38	354 1/2	71	662 1/2
6	5 1/4	39	364	72	672
7	6 1/4	40	373 1/2	73	681 1/2
8	7 1/4	41	382 1/2	74	690 1/2
9	8 1/4	42	392	75	700
10	9 1/4	43	401 1/2	76	709 1/2
11	10 1/4	44	411 1/2	77	718 1/2
12	11 1/4	45	421 1/2	78	727 1/2
13	12 1/4	46	431 1/2	79	736 1/2

## A Necessity for Lumber Users

The Perry Lumber Reckoner makes figuring easy. Tells the number of feet in any number of pieces—note cut of sample page at top. Gives exact number quicker than you could guess at it. Keeps you from making costly mistakes in your estimates; saves time and labor. Covers all the different sizes of lumber, and is so indexed that you can turn to the right page instantly.

Book is bound in cloth; seventh edition; fits the pocket. Thousands in use. Sent to any address, prepaid, for \$1.50. Write for one; money refunded if you ask.

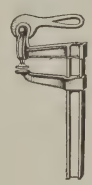
**\$1.50**

**Benj. L. Jenks**  
1201 Marshall Bldg.  
Cleveland Ohio

# CLAMPS

## --the COLT'S Line for all Purposes

When you need clamps, think of "COLT'S"—the world's standard for 34 years. Any clamp or jack shown here will be sent to any address on receipt of price. Money refunded if goods are not absolutely satisfactory.



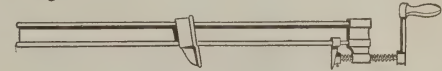
### Long Reach Clamp

Made of 1 1/2" I steel bar; has 6" reach; eccentric or screw type. Specially adapted to carpentry and building where pressure is required 6' from edge of work. Sizes 12" to 96". 12" size, net price doz.....**\$12.00**



### Automobile Jacks Have Many Uses

More practical than screw jacks for raising porches and small buildings, and many other purposes; operate quickly; no lost motion. Has ample strength—light weight; double acting; capacity one ton. Net price doz.....**\$25.20**



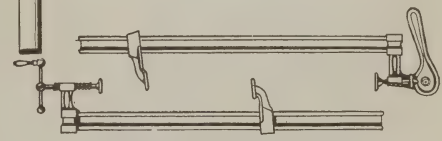
### Colt's Vise Clamp

Ideal for wide work—sash, doors, blinds, etc. 1 1/2" steel I-Bar; 3/4" steel screws. Crank and handle one-piece malleable iron. Double locking device of ribs and lugs; extra heavy sliding foot; U-Bar style also. All sizes 12" to 96". Price of 12" style doz.....**\$10.40**



### Universal Clamp

Broad jaw clamping surface; quick acting; eccentric or screw; clamping plate finds own level and parallel automatically; will not mar veneer or other work. Several styles and sizes. No. 1 as illustrated. 1 1/4" I or U-Bar, 4 1/2 x 1 1/2" jaws, 12" size, price per doz.....**\$7.93**



### Colt's Cabinet Clamp

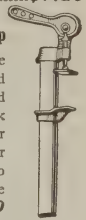
Quickest, easiest operating clamp made; improved locking device foot. Notches or spring on bar not necessary; eccentric or screw. Made of 1 1/4" I-Bar steel; 2" reach; for cabinet makers, carpenters and builders. Sizes 10" to 96". 12" size, price per doz.....**\$7.20**



### Mitre Clamp Short Reach Clamp

Mitre set and clamped by one motion of cam. Light and strong. Positive action; easy applied, no springs. Refined malleable iron; tempered drill steel spurs. Price per doz.....**\$9.60**

Designed for wide thin work. Adapted to table, chair and other work 2" thick or less. Eccentric or screw; 1 1/4" U-Bar steel. Sizes 10" to 96". 12" size, price per dozen.....**\$7.20**



Save money and get better clamps by writing today for our complete catalog No. 258 which gives styles, sizes and prices on all clamps necessary for your work.

**Batavia Clamp Company**  
195 Center St. - Batavia, N. Y.

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ON LETTERS YOU  
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## Make Your Dollar Produce More in a New York City Hotel

**\$2.50** A pleasant room with private bath, facing large open court.  
**PER DAY** (Not one room, but one hundred of them.)

**\$3.00** An excellent room, with private bath, facing Street; South exposure.  
**PER DAY** (Not one room, but eighty-seven of them.)

Also attractive room without bath for **\$1.50** per day. The restaurant prices are most moderate.

### Location

One minute from 5 of the largest department stores.

Five minutes' walk from 19 principal theatres.

Within a block of the Fifth Avenue shopping district.

Every line of transportation passes door. Fifth Avenue Bus lines and principal surface lines.

The Hudson Tubes across the street.

Elevated Railroad Station across the street.

Subway Station three minutes away.

Grand Central Station within 7 minutes.

Pennsylvania Railroad station just one block away.

**For convenience one could ask no more**

### The Hotel

Everything new and modern. A five-million dollar hotel equipped to satisfy the most exacting taste

**600 Rooms 400 Baths**

*All Baggage Transferred Free to and from the Pennsylvania Station*

## The Hotel Martinique

On Broadway, 32nd to 33rd Sts.

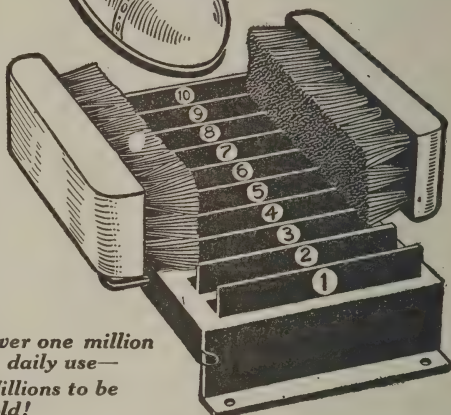
NEW YORK

CHARLES LEIGH TAYLOR, President  
 WALTER CHANDLER, JR., General Manager  
 WALTER S. GILSON, Vice-President



## \$25.00 Paid For One Day's Work

*New—Mighty Money-Maker*



Over one million in daily use—  
 Millions to be sold!

## The Million Dollar Hit!

New, wonderful home invention, just introduced, yet million sales already recorded. Tremendous, rapid sale staggers country. Agents happy—banking enormous profits daily. Mighty opportunity for you to get the mighty dollar. Failure impossible. **Experience unnecessary.** Money rolls in first hour—\$10.00 to \$30.00 daily. Amazing cash records made. Walters made \$25.00 first day; never sold goods before. Arnold N. D. Carpenter, orders one, then 2 gross; sold 160 in 2 days.

### Cleared \$80.00 in 2 Days

Hagen, Texas, sold 100 in two days. Webb, Pennsylvania Contractor, averaged 10 sales per hour. O'Connell, Montana, 25 first day. Mike Bock, Minn., writes: "They are fine sellers; worked one day and sold 30 (profit \$15.00)." Harry Gassmann, Illinois: "Can sell scrapers as fast as I can get them. Overwhelmed with orders. Everybody wants scrapers; 100 already sold." Roy Burningham, Mass.: "Send 10 dozen. One week's work." Hundreds like these. You, too, can have money in abundance.

## Grab's Scientific Shoe Cleaner

sells itself—you take orders—that's all. Every family wants one on their doorstep. Replaces unsightly, unsanitary, crude door mat. **Automatically removes mud, dirt, snow from shoe in one operation.** Cleans sole, sides, heel. Works like magic—sells like "sixty." Saves drudgery, time, money, shoes—saves carpets, floors. Mechanical wonder. **Has 7 new patented features not found in any other scraper—10 steel blades—10 dirt outlets—twin adjustable and removable brushes—compound springs. Rotates for sweeping.** Can't clog—practically self-cleaning. Handsomely enameled. Nothing else like it. Nothing so popular—so easy to sell. **Selling price only \$1.00.** You make half—100%. **Satisfaction guaranteed.** Write quick for free catalogue—exclusive agency. Better still, send order, naming territory. Investigate anyhow.

**Security Manufacturing Company**  
 Department 103 Toledo, Ohio

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The catalog of 76 pages shows refrigerators for residences, stores, meat markets, florists shops, ice cream parlors, restaurants, hotels, etc. The style of these refrigerators, the material and workmanship are first class and the system of refrigeration excellent. Write for a copy of this handsome book and get in touch with a money-making line. You will find the blue prints valuable. The Herrick Refrigerator Co., Waterloo, Iowa, will send Catalog 23N on request. Ask for it.

### Bungalow Plans.

The Bungalow Specialists, 2148 So. Kedzie Avenue, Chicago, Illinois, are endeavoring to draw the contractors' attention to the necessity of correctly drawn to scale plans and details that will enable the contractor to prove to his client that money can be saved through the detailing and specifying of material that is now being universally used throughout modern homes of the present day, without in any way detracting from the artistic appearance and treatment of such materials.

This is a good point for every contractor to consider as it is sure to increase his business and show his people that he has their interests at heart. Such plans can be obtained from the above concern at very reasonable rates. They are sold on the guarantee of complete satisfaction to every purchaser or money refunded.

Their new 1915 Booklet, showing many designs of carefully planned and well designed bungalows and residences, will be sent to NATIONAL BUILDER subscribers upon request. The cost of the buildings illustrated, when complete, range from \$2,000 to \$4,000, which from past experience has proven to be the amount of money that the majority of investors can afford to outlay for a permanent home. They have an efficiency department, prepared to give prompt attention to any special drawings required and they request that your own ideas be submitted to them for prices on such special work.

### The A B C Protractor Square.

The carpenter and contractor is interested in any tool or device which will save time and labor as well as insure accuracy. The A B C Protractor Square, made by the Stamp & Tool Works, La Crosse, Wis., is

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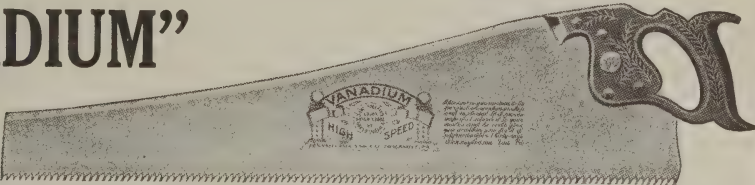
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such a device, as it will give any rafter or stair cut and saves a vast amount of time in framing. This square is not complicated nor is it difficult to learn to use it. It occupies little space and readily folds to go in the tool kit.

The Stamp & Tool Works have a circular explaining the uses and methods of use of this square which they will be glad to send our readers. It will be of interest to them and show the simplicity of the square as well as its practical value.

## Safety First Shop Signs

The McClary Mfg. Co. have had safety first signs printed and placed in conspicuous places where the word "safety" is kept before the employees. The following is the sign:

### Safety First

Do not work with unsafe tools. Stop. Tell the Foreman.

Careful men are usually efficient.

Careless men are not.

Remember it is better to cause delay than an accident.

Is your department clean and tidy?

Look into the corners.

Cleanliness means order.

Order spells efficiency.

The employees are asked to memorize them and get the spirit of them. The duty of Safety First should be impressed on every employee.

## The Window Chute.

Few house owners are able to get in all of their winter's coal in one load. It usually means several trips for the coal man whether on the same day or spread through the winter. At such times the Window Chute made by the Holland Furnace Co., Holland Mich., proves its value as it allows the coal for other fuel to be brought into the furnace room without damaging the building in any way. When not open and in use as a coal chute it is securely locked and provides light to that portion of the basement.

Booklet C prepared by the Holland Furnace Co., shows the construction, sizes and prices of the Holland Window Chute and will enable our readers to order direct for the different sizes required for their spring business.

Advertisers' Section.

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GE 67

Front Cover

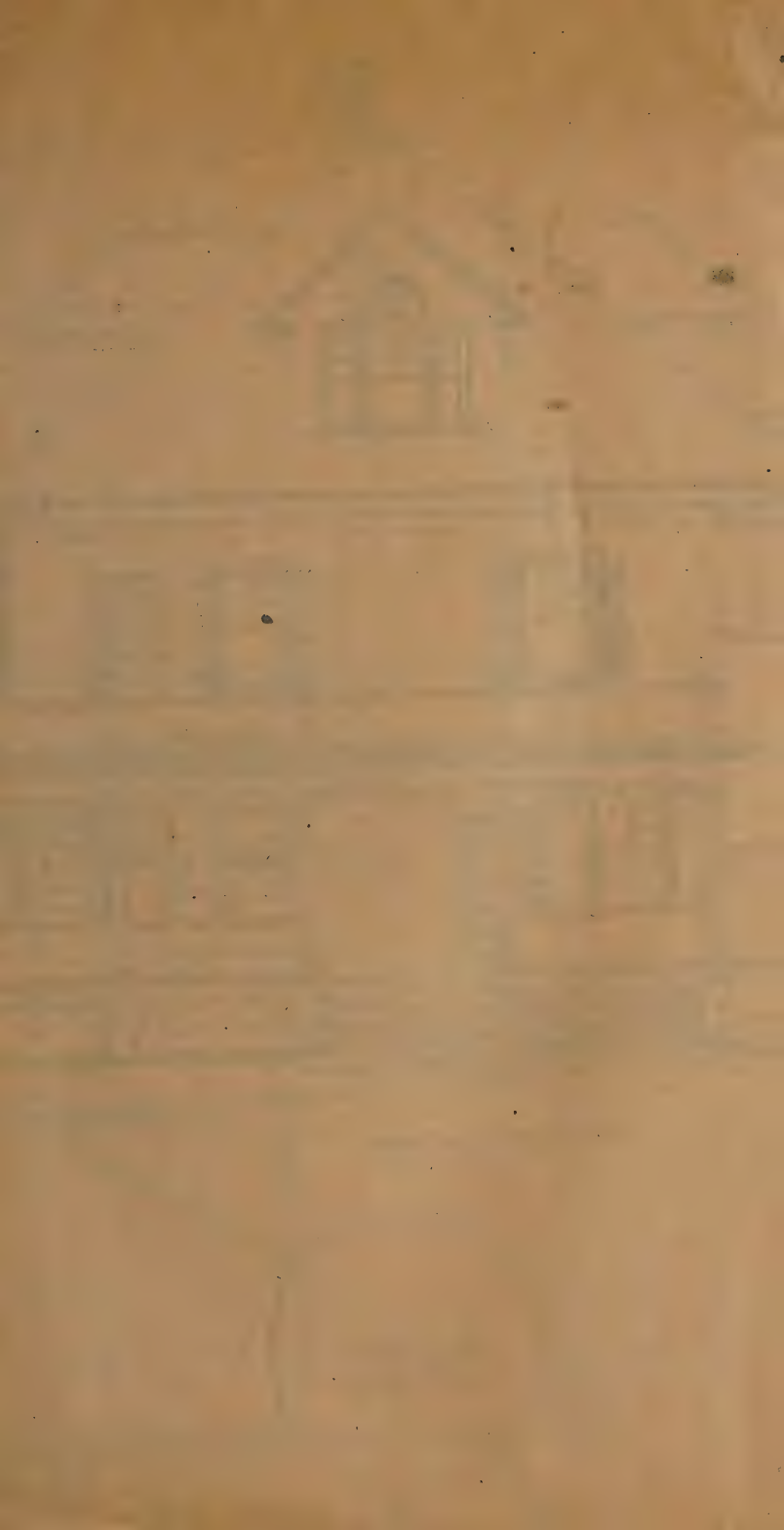
Wood panel doors



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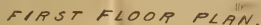
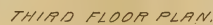
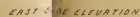


## MARCH, 1915

NATIONAL BUILDER DESIGN No. 393,  
PROVIDENCE RESIDENCE

Scale for Floor Plans, 1 inch equals 4 feet. Elevations and Sections, 1 inch equals 8 feet.

FOR ESTIMATE, SEE PAGES 99

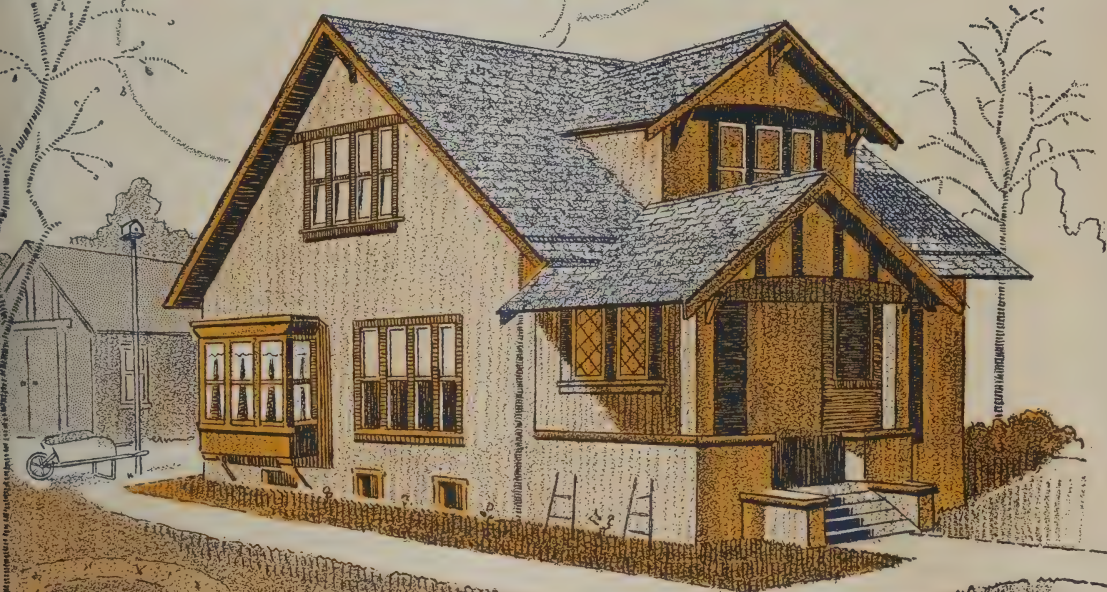




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APR 1915

# THE NATIONAL BUILDER

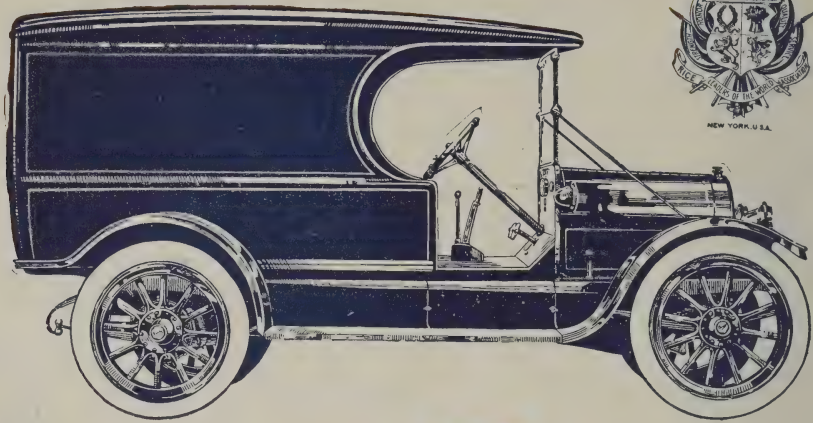


APRIL 1915  
PRICE 15¢

A Stucco House  
WILLIAM ARTHUR BENNETT  
ARCHITECT.

For Working Plans of this house see  
double supplement of this month.  
A complete estimate is given on page 35.





**\$850**

*With open body  
Equipped with Electric Starting  
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*Overland*

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CARS**

**\$895**

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**O**NLY rapid transportation facilities will enable you to meet the strenuous competition you are up against today. A motor delivery car will furnish the quick action necessary to enable you to supervise your work properly, even though located at widely separated points.

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The Overland Delivery Car is electrically lighted and started. Ignition is by high tension magneto. No batteries are required. It has a revolving oil indicator, the best of assurance that lubrication is right.

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# THE NATIONAL BUILDER

Vol. 57 (51st Year) Chicago, April, 1915 No. 4



A Stucco House in the Suburbs.

NATIONAL BUILDER DESIGN No. 394

William Arthur Bennett, Architect, Chicago

For Floor Plans, Elevation, etc., see Double Supplement of this month. Estimated Cost, \$3,154.97.\*

## Estimate of a Riverside Cottage

*I. P. Hicks*

### EXCAVATING

154 yards excavating, 35c.....\$53.90

### MASONRY

820 cu. ft. concrete wall, 25c.....\$205.00  
780 sq. ft. cement floor, 10c..... 78.00  
33 lineal ft. chimney, \$2..... 66.00  
Catch basin ..... 18.00  
1 Coal chute ..... 15.00  
260 yds. outside stucco on Bostwick

\*Materials are figured at Omaha prices. Car-  
penter labor figured at 50 cents per hour.

Truss-Loop Metal Lath, \$1.25 325.00

Total masonry .....\$707.00

### LUMBER BILL

	Feet
2 6/ 8x16 ft. girder .....	128
2 6/x 6x14 ft. posts .....	84
10 2/ 6x16 ft. box sills .....	160
10 2/10x16 ft. box sills .....	270
29 2/10x24 ft. first floor joists.....	1,160
29 2/ 8x24 ft. second floor joists..	928



40 2/ 4x14 ft. ceiling joists.....	360
8 2/ 8x10 ft. for porch .....	108
11 2/ 8x12 ft. for porch .....	176
2 2/ 8x12 ft. rear porch .....	32
3 2/ 8x16 ft. rear porch .....	63
8 2/ 4x12 ft. porch ceiling .....	64
16 2/ 4x12 ft. porch rafters.....	128
118 2/ 4x12 ft. outside studs .....	944
34 2/ 4x12 ft. gable studs .....	288
20 2/ 4x16 ft. dormer .....	220
52 2/ 4x18 ft. first story partitions	624
6 2/ 6x18 ft. first story partitions	108
40 2/ 4x16 ft. second story parti- tions .....	440
4 2/ 6x16 ft. second story parti- tions .....	64
24 2/ 4x12 ft. plates .....	192
28 2/ 4x16 ft. plates .....	308
52 2/ 6x24 ft. rafters .....	1,248
7 2/ 6x10 ft. rafters .....	70
14 2/ 6x12 ft. rafters .....	168
30 1/ 6x12 ft. braces .....	180
6 1/ 4x16 ft. ribbon boards .....	33
24 1/ 4x12 ft. bridging .....	96

Total feet dimension.....8,644

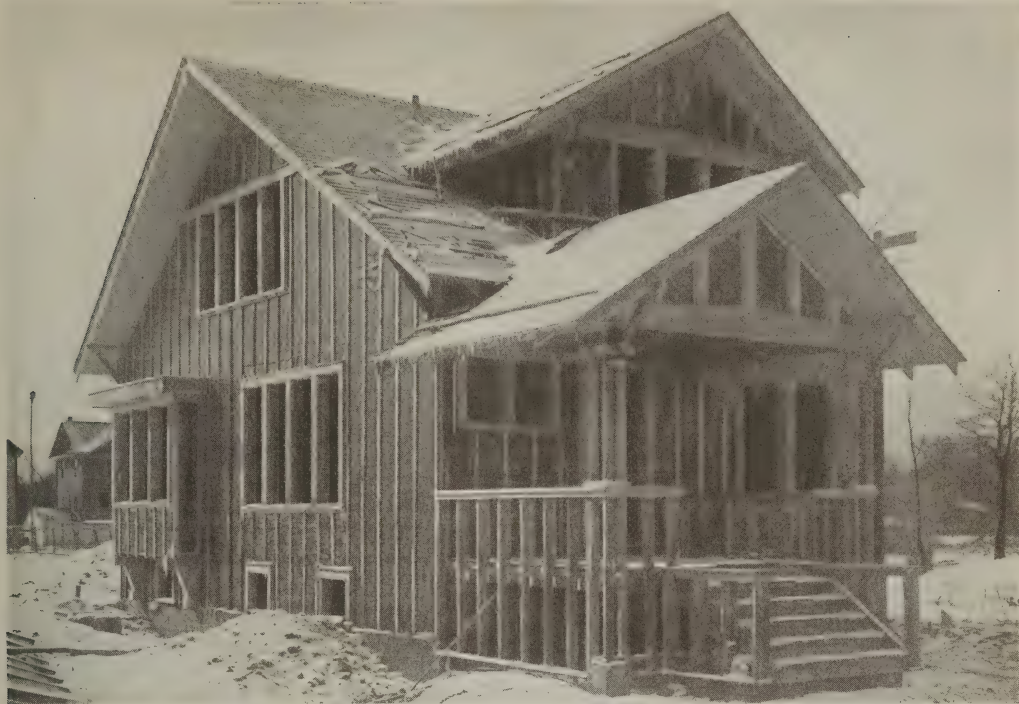
8,644 ft. framing lumber, \$26.....	\$224.74
2,350 ft. #2 sheathing, outside walls, \$26.....	61.10
1,550 ft. #2, 8-inch Y. P. lap rough floors, \$26 .....	40.30
1,700 ft. #2, 6-inch sheathing, roof, \$26 .....	45.20
16½ M. clear R. C. shingles, \$4..	66.00
520 ft. 1x2¼ face red oak fg., \$85 .....	44.20
950 ft. 1x2¼ face maple fg., \$65	61.75
160 ft. 1x4x10 ft. fir fg., porch, \$45 .....	7.20
66 ft. 1x4x12 ft. fir fg., porch, \$45 .....	2.97
160 ft. 5/8x4x10 ft. fir ceiling porch, \$30 .....	4.80
66 ft. 5/8x4x12 ft. fir ceiling porch, \$30 .....	1.98
700 ft. ¾x4x12 to 16 ft. fir ceiling cornice, \$34 .....	23.80
10 1x6x14 ft. fir finish outside base, \$45 .....	3.15
2 1½x6x14 ft. fir finish, \$45..	.81
6 1½x6x12 ft. fir finish, \$45..	2.82
4 1½x6x16 ft. fir finish, \$45..	1.80
5 1½x6x12 ft. fir finish, \$45..	1.71
2 1½x12x12 ft. fir finish, \$45..	1.35
3 1½x6x10 ft. fir finish, \$45..	.85
2 2x10x10 ft. fir finish, \$45...	1.48

1 2x10x14 ft. fir finish, \$45...	1.03
4 1x12x14 ft. Y. P. finish, \$40.	2.24
7 1x8x12 ft. fir finish, \$45....	2.52
9 1½x12x12 ft. fir finish, \$45.	5.78
10 Rolls tarred felt, \$1.....	10.00

Total lumber bill.....\$619.58

## MILL WORK

2 5x5x8 ft. porch col., \$1.25....\$	2.50
1 piece porch rail, top, 14 ft., 5c.	.70
1 piece porch rail, top, 12 ft., 5c.	.60
1 piece porch rail, bottom, 14 ft., 5c .....	.70
1 piece porch rail, bottom, 12 ft., 5c .....	.60
100 balusters, 1½x1½x20", 3c....	3.00
3 porch newels, 4x4x4 ft., 40c....	1.20
13 gable brackets and bay windows, \$1.50 .....	19.50
160 ft. 7/8" cove mold, ½c.....	.80
284 ft. 2" bed mold, 1c.....	2.84
1 twin cellar window frame, 10x16, 2 lts. ....	3.50
4 cellar window frames, 10x16, 3 lts., \$1.75.....	7.00
3 cellar window frames, 10x16, 2 lts., \$1.50 .....	4.50
1 cellar door frame, 2' 8"x6' 0"	2.25
5 cellar sash, 10x16, 2 lts., \$1.00	5.00
4 cellar sash, 10x16, 3 lts., \$1.25	5.00
1 cellar door, 2'8"x6'0"x1¾"..	2.40
2 outside door frames, 3'0"x7'0", 1¾, \$2.25 .....	4.50
1 twin window frame, 28x30, 2 lts .....	4.50
1 mullion frame, 4 windows, 20x30, 2 lts. ....	9.00
1 mullion frame, 4 windows, 20x26, 2 lts. ....	9.00
1 triple frame, 20x26, 2 lts.....	6.75
1 triple sash frame, 24x56, 1 lt..	5.25
1 twin sash frame, 18x24, div., 12 lts. ....	3.50
2 frames, 30x22, 2 lts., \$2.25....	4.50
1 frame, 18x22, 2 lts.....	2.00
2 sash frames, 2 lts., 16x36, \$1.75	3.50
1 frame, 26x30, 2 lts.....	2.25
2 windows, 28x30, 2 lts., D. S., \$3.20 .....	6.40
4 windows, 20x30, 2 lts., D. S., \$2.50 .....	10.00
7 windows, 20x26, 2 lts., S. S., \$2.20 .....	15.40
3 sash, 24x56, 1 lt., D. S., \$3.20..	9.60
2 sash, 18x24, Div., 12 lts, \$2.50.	5.00



The House Under Construction.

4 sash, 16x36, 1 lt., \$1.60.....	6.40	142 ft. base, oak, 4½c.....	6.39
2 windows, 30x22, 2 lts., D. S., \$3.30 .....	6.60	142 ft. floor mold, 1c.....	1.42
1 window, 18x22, 2 lts., S. S.....	1.60	130 ft. picture mold, oak, 2c.....	2.60
1 window, 26x30, 2 lts., D. S.....	3.00	48 ft. plinth blocks, Y. P., 5c...	2.40
1 set jambs, 5'0"x7'0", oak.....	1.00	156 ft. Y. P. casings, doors, 2½c..	3.90
1 set jambs, 4'0"x7'0", oak.....	.90	180 ft. Y. P. casings, windows, 2½c	4.50
1 set jambs, 10'0"x7'0", oak.....	1.20	152 ft. Y. P. head casing, 2½c...	3.80
1 set jambs, 3'0"x7'0", oak and Y. P. ....	.80	152 ft. Y. P. cap mold, 2c.....	3.04
1 set jambs, 2'8"x7'0", oak and Y. P. ....	.70	152 ft. Y. P. fillet, ½c.....	.76
2 set jambs, 2'8"x7'0", Y. P., 60c	1.20	198 ft. Y. P. door stops, 14 ft. length, 1c .....	1.98
3 set jambs, 2'6"x7'0", Y. P., 60c	1.80	210 ft. Y. P. window stops, 14 ft., 1c .....	2.10
3 set jambs, 2'8"x6'6", Y. P., 60c	1.80	314 ft. Y. P. base, 3½c.....	10.99
2 set jambs, 2'4"x6'6", Y. P., 60c	1.20	314 ft. Y. P. floor mold, ½c.....	1.57
26 oak plinth blocks, 8c.....	2.08	150 ft. Y. P. picture mold, 1½c...	2.25
168 ft. oak casing, 12 ft. oak, doors, 3½c .....	5.88	Stairs .....	40.00
108 ft. oak casing, 12 ft. oak, win- dows .....	3.78	Total mill work.....	\$301.17
88 ft. head casing, oak, 3½c.....	3.08	CARPENTER LABOR	
88 ft. cap mold, oak, 3c.....	2.64	8,644 ft. framing lumber, \$10....\$	86.44
88 ft. fillet, oak, ½c.....	.44	5,600 ft. sheathing, \$10.....	56.00
40 ft. window stool, oak, 3½c....	1.40	16½ M shingles, \$2.00.....	33.00
40 ft. apron, oak, 3c.....	1.20	926 ft. porch floors, ceiling and cornice ceiling, \$15.....	13.89
126 ft. window stop, oak, 1c.....	1.26	243 lineal ft. cornice, verge boards and bed mold, 10c.....	24.30
18 ft. door stop, oak, 1½c.....	.27		



Front porch steps.....	5.00	Mill work .....	301.17
Rear steps .....	4.00	Carpenter labor .....	415.75
Cellar steps .....	3.00	Hardware and nails.....	61.00
1,470 ft. flooring, \$20.....	29.40	Tin work (no gutters shown)...	10.00
11 squares smoothing, \$1.50....	16.50	Plastering, 634 yds. on Bostwick	
Finishing 45% cost of mill work	135.52	Truss-Loop Metal Lath,	
Setting frames .....	8.70	50c .....	317.00
Total carpenter labor.....	\$415.75	Plumbing .....	270.00
THE COMPLETE ESTIMATE		Electric wiring .....	42.00
Excavating .....	\$ 53.90	Painting .....	90.00
Masonry .....	707.00	Furnace heat .....	125.00
Lumber bill .....	619.58	Incidentals, 5% .....	142.57
		Total estimate .....	\$3,154.97

# How To Use This Estimate

This estimate is figured at Omaha prices, with carpenter labor at 50 cents an hour. To use this estimate for other localities the reader will note that the price of each grade of lumber, as well as all other materials, is given in the regular trade units, that is per thousand feet for lumber, per thousand for shingles, per cubic yard for excavating, etc.

It is a simple matter to substitute the prices current in your vicinity for the

prices given in this estimate and to extend the quantities and so determine the exact cost for your neighborhood.

For instance, framing lumber may be \$30 per thousand in your town while it is figured in this estimate at \$26. Simply extend the number of feet at \$30; labor may be more or less. The owner may want to contract for the furnace or plumbing separately. The detailed estimate makes these changes possible.

# In The Suburbs

**S**URROUNDING every large city one finds independent communities, which are still closely associated with the city, both financially and socially. The homes in these communities are owned by those having business in the city, but who realize the importance of plenty of fresh air and sunshine, good schools and churches as well as the neighborly spirit which maintains in the smaller places.

Chicago, being free to expand in all directions except to the East, is in the center of a large number of such communities. The town of Riverside is particularly favored as to location, being only a short distance out and connected to the city by both steam lines and trolleys, while, like most of the suburbs, the land is generally level. It has the unusual charm of a navigable stream, which wanders in an irregular course through the town, giving park and residence facilities which may well be envied by many more pretentious

places. The fullest advantage has been taken of this stream and from the further fact that being laid out at the start as a "Garden City," the streets are curved and winding, permitting a diversity of landscape effects.

The architecture of this suburb is, in the main, the logical arrangement of the site. Frame buildings, bungalows, stucco, brick and stone, are seen in many styles, but the locations and the changing directions of the streets prevents a disparaging comparison. When two houses stand close together, carefully lined up to an established building line, one cannot help noting which is the larger and more pretentious. Even a row of unique bungalows gives one an eye strain, before the trees grow up about the sidewalk line and the evenly spaced latticed porches get covered with various kinds of shrubbery.

The laying out of the streets, in this case the work of real estate men who could see

more than rectangular lots at so much a front foot, is to be recommended wherever such a plan is possible. Individual preferences as to size, light, exposure, view, etc., can readily be satisfied. Rounded corners permit the exercise of the greatest talent of the architect and gardener, and each owner feels his obligation to keep his place up in good shape. Irregular side lines make division lines almost unnecessary, and the lawns can often join with only a suggestion of the limits of each. One instinctively feels that the keeping of the town is in his hands, and so becomes a better citizen for living in such a place.

While the plan of the house contributes largely to the comfort of the resident, the exterior is what the stranger see first. It must therefor be presentable, and it is a delicate matter to determine exactly where necessary utility ends and where ornamentation begins. There is a little deviation possible each way and yet how often we see misapplied ornaments in one place, and painfully plain areas close by. Designing is more than arranging rooms and areas, it must meet the needs of the occupant and satisfy the critical eye also.

No matter how partial one may be to stone, a well designed frame house will not

offend. The most captious advocate of brick will not complain of the texture or color of stucco, if well applied in accordance with a good design.

Stucco has probably had to stand more abuse than any other material. The composition, being susceptible to changes in proportions without detection, has often defeated the architect's intent. The apparent ease of application has led many to attempt stucco construction when they were not mechanically competent to do a good job. Even when intentions were good, and right materials were used, the weather might spoil the day's work. One would not tolerate for a moment a carpenter who did not know which end of the shingle to expose, and yet grosser errors by incompetent workmen are blamed on the material.

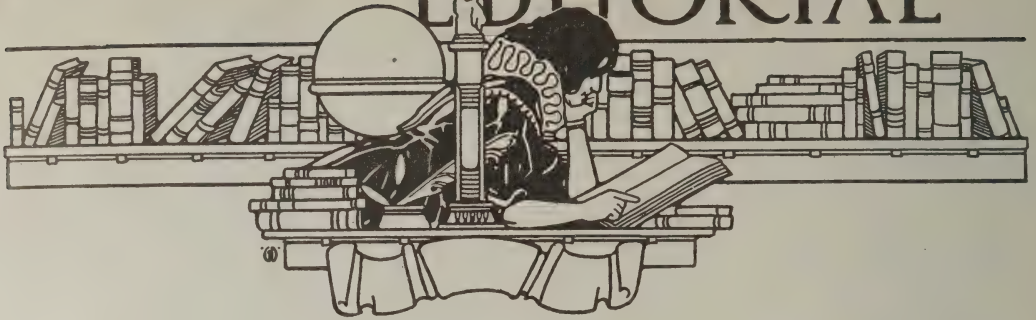
In the house shown on our supplement sheet this month, stucco was selected for the wall material, and the architect has so prepared the exterior that the value of the stucco is clearly brought out. The exterior could be of brick, stone or wood, provided the entire exterior design was changed, but the whole appearance is so satisfactory that one would hesitate before making any change whatever.



The Completed House, Showing the Grounds and Adjoining Building.



# EDITORIAL



Do not let small matters interfere with your regular labors—go on with your work as usual, regardless of the little interruptions.

\* \* \*

Whatever you do, do with zest,  
With all your power and skill  
And ever do your "level best"  
While clambering up a hill.

\* \* \*

"Smile and the world will smile with you" is a trite and timely saying; cultivate a smile—not a grin—and the world will pay tribute. Do not let the "Smile come off," it is worth money to you, and the longer you wear it, the more valuable it gets.

\* \* \*

Good nature, and a pleasing face, and a frank open bearing, are excellent certificates of recommendation, and often a good job, whereas a boisterous, "know-it-all" manner with fine testimonials often gets left behind, as a person of that sort is apt to repel instead of winning favors.

\* \* \*

Humility is not a quality to be practiced when dealing with hard every-day affairs. A polite and gentlemanly independence is always appreciated, and properly encouraged by all sensible employers, and the man who applies for a situation in a quiet firm manner, without boasting, or forcing his individuality to the front, generally makes good, and this is well known.

\* \* \*

It does not follow, however, that a "braggart" does not turn up, that possesses wonderful aptitude in some useful line or other. In our long experience we have run across several men who were

really wonderful fellows in the lines on which their inclinations ran, though we must confess, they were not by any means good all-round men outside their specialties, and were hardly as reliable as the man who had less vanity.

\* \* \*

Often the braggart is an indispensable man, but the more vanity he possesses the less discretion he holds. We have known some of them undertake work, and get through with it fairly well—where more experienced men were afraid to tackle the same work, another demonstration of the fact Pope so nicely puts it, "that fools rush in where angels fear to tread."

\* \* \*

The so-called Coercion Law of Kansas, and a few other places, is not meeting the welcome its friends expected, according to the "Outlook" which tells us that "the Supreme Court says in effect that such a law violates the right of contract; that for an employer to exact such an agreement is not coercion; and that the law is an infraction of the Fourteenth Amendment of the Constitution, which declares that no person shall be deprived of life, liberty, or property, without due process of law." The decision was not unanimous; Justices Hughes, Holmes, and Day dissented, the last named filing an elaborate dissenting opinion. The majority opinion, while recognizing the right of a man to join unions, denies that he has the right to do this, and still remain in the employ of one who is unwilling to employ a union man. It says that a contract for employment is included in the right to make contracts for the acquisition

of property, although it may be noted that the Clayton Law, just passed, declares that a contract of work is not a contract for commodity, but for service.

\* \* \*

To quote the Supreme Court decision which was delivered by Mr. Justice Pitney: "To ask a man to agree in advance to refrain from affiliation with the union, while continuing a certain portion of employment, is not to ask him to give up any part of his constitutional freedom." He is free to decline employment on these terms, just as the employer may decline to offer employment on any other, for it takes two to make a bargain; and, having accepted employment on these terms, the man is still free to join the union, when the period of employment expires. And if bound by his own agreement to refrain from joining the union during a stated period of employment, he is in no different situation from that which is necessarily incident to contracts in general.

The dissenting opinion, however, declares that it is the thoroughly established doctrine of this court "liberty of contract may be circumscribed in the law of the State, and the welfare of the people." "No Court," says Judge Day, "has yet defined precisely the limitations of the police power of a State." And he sees no reason why a State may not, under the protection of police power, protect the rights of an employe to obtain employment without signing away his legal right to join a union. He points out that no one would question that an employer could be forbidden from demanding an agreement that an employer should not join the National Guard, or join a certain political party. "Why," he asks, "would not the same principle apply as to the labor unions?" Justice Holmes sees no reason, if a workman believes that only by belonging to a union can he secure a fair contract, "why his liberty to do so may not be enforced by law in order to establish the equality of position between the parties in which liberty of contract begins. That effective and collective bargaining is essential to a fair contract for labor is now largely held"; a ready parallel case

would be an attempt of employes through the union to prevent employes from joining in an employes' association, "with all due respect to the authority," says The Outlook, "and finality of the Supreme Court majority decision, it may be that the large questions here involved may hereafter come up in some different form for further consideration."

\* \* \*

The assessed valuation of New York City is approximately one-third of the total assessed valuation of taxable property in the 184 leading cities of the United States with a population of more than 30,000 according to the Real Estate Bulletin. The total assessed valuation of taxable property in the cities was \$26,059,387,438 in 1910. This total \$17,491,117,653, or 67.2 per cent was in eighteen cities which have a population of more than 300,000. The assessed valuations in some of the larger cities are shown as follows:

New York.....	\$8,322,958,952
Chicago .....	848,994,536
Philadelphia .....	1,458,851,880
Boston .....	1,409,479,723
Jersey City.....	241,561,118

#### REAL PROPERTY

New York.....	\$7,004,892,674
Chicago .....	603,022,875
Philadelphia .....	1,457,108,534
Boston .....	1,118,992,100
Jersey City.....	184,481,409

The basis of assessment in the above cities are: New York, Philadelphia, Boston, and Jersey City, 100 per cent. Chicago 33 per cent. Chicago's totals should therefore be multiplied by three for comparison.

\* \* \*

The man who wastes no time, and takes pride in doing his work neatly, and is friendly to his fellow workmen, is always given employment. This man with mechanical skill at spare time, looking over his tools to see they are in good condition, finds he has no hack saw, and does not want to accumulate too many tools. He takes a cut-off saw, files small teeth on the back edge of the blades about the length of hack saw blade, gives best results, and can be made in a few minutes. This makes a handy saw for remodeling old buildings.



# Models of Buildings

How to Make Them in Card Board, Plaster, Clay, Etc.

*Albert E. Gredig*

THE two photographs accompanying this article represent card board models made from sketches before working drawings were started; this course was taken for the reason that my client was unable to form a definite idea what the house, when finished, would look like from any working drawings which an architect might lay before him. He was delighted with the design, when the models were completed.

This house was to be built by a Real Estate man and was to be sold on completion, or before, if possible, so that the writer made an exact drawing of the lot, on a scale of four feet to the inch. The model of the lot was made by means of card board, as was described in an article on card board models in the last April edition of THE NATIONAL BUILDER. The card board model of the house was constructed on the same scale as that of the lot, four feet to the inch, as shown in the accompanying photographs, and these models were placed in a display window of one of the leading business houses while the contractors were erecting the building. A sign was placed above the model stating that the house was being erected on a certain street and would be for sale when completed. The advertisement also stated that the completed house would be exactly like the card board model shown.

I am now preparing to make fifteen to twenty card board model designs ranging from a bungalow to two-story houses; these designs will also represent lawns, sidewalks, streets,—in short, all the immediate surroundings, and when complete will be placed in a large display window; a sign will be placed above each house model, giving the price of the house and lot. In this way the buyer will be able to see just what he is going to buy, much better than he could possibly see from even a water color perspective.

These models make an ideal proposition for any Real Estate company; the company may advertise lots and houses in the manner above indicated, stating to the prospec-

tive buyer that a house will be built exactly like the card board model. I believe that there is an unlimited field for models of this kind, whether in thin or thick card board, in wood or in plaster of Paris, although the plaster models are harder to make than the card board or wood models are; besides, the plaster models do not show up the colors, etc., as well as the card board models.

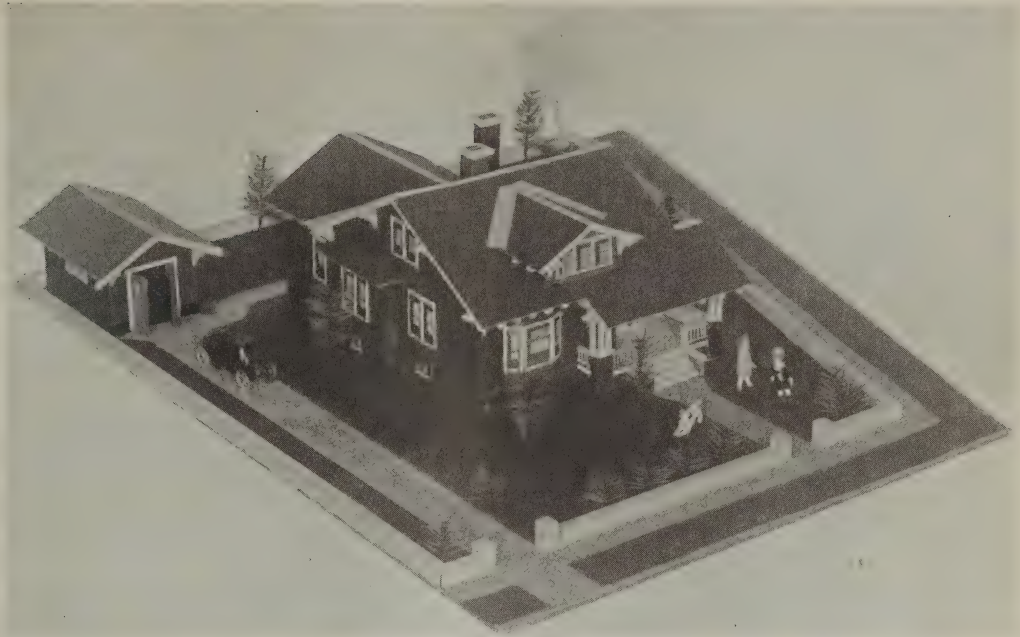
With the aid of a foot power scroll saw and one-half inch soft pine, one can quickly saw out the design, using the Supplements furnished by this magazine.

A very attractive design can be made of stucco or pebble dashed houses, either on card board or on wood. To apply the stucco effect, first apply a coat of glue on the side walls where stucco is to be used and before the glue sets, apply dry plaster of Paris or white cement. The best method of applying the plaster or cement is to use a small bellows.

If pebble dash is to be used, first apply the coat of glue and then dust on a fine white sand, instead of plaster.

The making of plaster models, while more difficult than those of card board or wood, is a more interesting method. There are, of course, several methods of making these models, so I will explain the methods I generally use for bungalows or other small designs.

The first method is to build up the side walls, using three-quarter inch pine, making the outside dimensions one inch smaller than the finished design. In forming the base, use seven-eighths inch material, same to include the entire space to be covered by the house, including all porches, projections, etc. Nail the base to the side walls described above, taking care to leave one inch of exposed base all around. Now, each outside form is to be made up separately and must be well sand-papered on the inside. The recesses, which indicate windows, doors, etc., must be arranged for the inside of the outside form. Lay these openings



Model of a Suburban Place Showing the Grounds as Well as the Buildings.

out carefully and then cut out of three-eighths inch pine a piece the exact size of doors, windows or other recesses and tack the same on the inside of the outside forms where you have already laid such openings off. Sand-paper all edges of the small pieces, so as to secure sharp openings. After all sides have been completed, the inner faces are to be covered with olive oil, and then gently tacked together at all corners. Care must be taken not to nail the several parts tightly as they are to be taken off, after the side walls have been made. Now, the outside form is complete and ready to fit down to the outside edge of the base, and if the measurements have been correct, the fit will be perfect. Now tack the outside form to the base.

You are now ready to pour the plaster, which must not be made too thick, into the forms. The correct way would be as follows: Secure an enameled basin and fill the same about two-thirds full of water, then sprinkle the plaster into the same carefully with the hand,—by this method you will be able to prevent any lumps remaining in the plaster. Continue sprinkling the plaster until it remains on top and does not sink. By this method you will prevent any air bubbles forming in the plaster, also, you can tell when you have enough plaster for

the amount of water. The mixture must now be beaten with a spoon, in a circular manner, without bringing the spoon to the surface, the idea being to prevent the formation of air bubbles. The mixture should have the consistency of cream. Now, skim off the top and you are ready to pour. Plaster of this mixture will run to all parts of the mould. Allow an hour or two for plaster to set and then take off the outside forms very carefully. The forms on the inside can remain in place. Next, prepare a false roof, about one inch down from where the finished roof will come, and gently tack it in place. Place a temporary form for the support of the lower side of cornice, with a temporary piece of wood placed at the lower edge, to prevent the plaster running over. Make up another basin of plaster for the roof. This mixture should be a little thicker than that used for the side walls. Pour in the plaster, working it to an even thickness with a combination trowel and spoon. Remove the strip at the lower side of the roof before the plaster sets too hard and work out the cornice mould, guiding the same on the temporary form under soffit of cornice. This mould can be cut out of thin wood, cutting the same to any shape of mould desired. By using this method, no top form is required



in making the roof, although one could be used if desired. Any rough places in the top of roof can easily be removed after the plaster is dry.

The chimneys, porch columns, balustrades, brackets, etc., can be moulded separately. Secure some three-eighths inch pine and prepare small boxes to take care of all of the small parts. For instance, if you wish to mould round columns, make two small boxes, a little longer and wider than the column to be made and each box just half as deep inside as thickness of the column. Now, secure some modeller's clay and fill each box to the top, taking care to remove the excess of the clay, so that when the two boxes are placed together, the fit is exact. Cut a semi-circle in each of the boxes at the upper edge of the end and midway between the sides of the box. With a sharp knife, cut out a wood model of the column, using red cedar. This model is to be pressed down in the clay you have placed in the box, as near the center as possible; now take the other box and press it down upon the first box and in such manner that the two boxes fit together perfectly and the two semi-circular openings in the ends are in correct position. Next separate the two boxes and remove the wood model, and by means of a knife cut a groove in the clay of each box from one end of the wooden column to the end of the box having the semi-circular opening.

The two boxes should now be bound together and the mould filled with plaster. The setting of the plaster will be quick, so that the plaster columns may be rapidly made and removed. Square edge articles may, of course, be made by this same method.

By adding a teaspoonful of strong glue size to a pail of water and using this water for your mixtures in making up the roof cornices, the plaster will not set so quickly. Remember, always take the forms off the sides at each end at the same time, so as not to break any edges. If defects do occur, they can be mended with proper care. Use a very sharp knife for scraping down rough places. You will find 00 sand paper very useful for smoothing up the finished model.

Another method of building the plaster models is to saw out the base, making it one-half inch smaller all around than the finished house is to be. Make up the out-

side walls and nail together and fit same down flush with the outside of base. Where doors and windows occur, make up a frame, using the outside measurements for the full opening. Make these frames up out of three-eighths inch by one-half inch pine with the three-eighths part to the outside and inside and the one-half parts at sides, top and bottom. Tack these frames wherever doors and windows occur. Tacking should be light, as they are to be removed when plaster is dry. Place one-eighth inch furring strips on the side walls on which the metal lath is to be placed. Work out the recesses for doors, windows, etc., as described in another part of this article, except that they are to be tacked to the inside form where they should show on the finished house. These frames are to be removed at completion, leaving an opening in the plaster. If desired, plaster can be moulded and placed in each opening, the doors to imitate doors and the windows to imitate windows. After a little practice, you will find that it will not be hard at all. The porches, roofs, etc., can be built up as suggested in another part of this article. The plaster is to be applied to the metal lath and troweled smooth. By using the glue size, the plaster can be handled a great deal more easily.

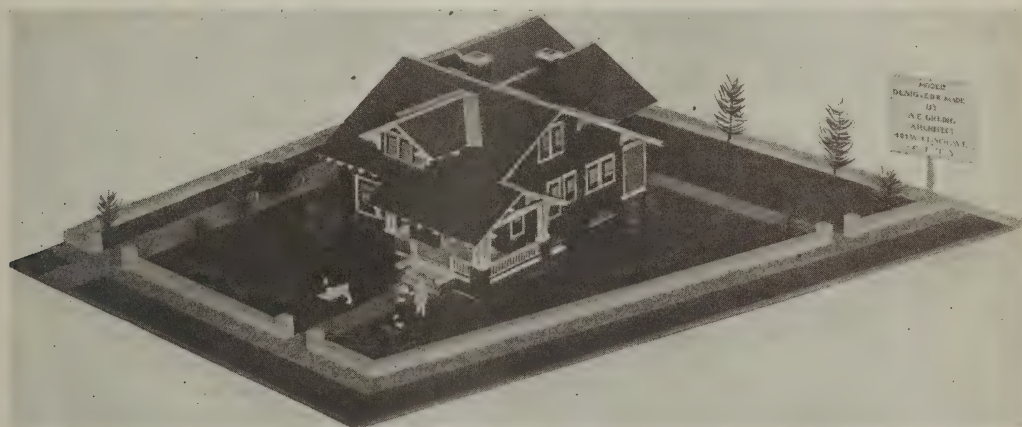
House models, if not too intricate, can be made up of modeller's clay and a plaster mould made from the clay model. This plaster mould must be made in sections so that it can be readily removed. The clay model can then be used for making other models.

In making up the different sections, proceed as follows: Apply your plaster to the clay model, taking care to divide it into as many sections as may be necessary, and when the first section is made, gently remove it and trim up the edges and provide a V-shaped opening on each side. Now apply clay water to the edges of mould and replace this mould back in position and apply the plaster for the next part. Now you are ready to remove the clay model and clean the inside of the plaster mould, by washing thoroughly with soap and water and then washing with clear water. Do this very gently, for the inside of this mould must not be damaged. The pieces should now fit together and be tied in place. Through an opening in the top, which must

be cut before binding the two parts together, pour in the plaster, gently rocking the mould so as to thoroughly fill all parts of the mould. In an hour or so remove the mould and you will find a perfect model

The new method here proposed for representing houses, together with their surroundings, has a number of advantages over drawings. It gives a most interesting diversion of work to the contractor or architect; but this is by no means the most important advantage which it affords. A cardboard model of a house gives a much more definite idea of a house, in all its details,

and yet his vast mind needed, for some of its loftiest generalizations, a mechanical construction, if possible, of the theories he was about to formulate; this instinct in the mind of the great scientist is seen more clearly in the following incident which occurred in the physical laboratory of the Royal Institution:—his assistant, Prof. Tyndall, had just discovered an interesting optical property of a certain crystal; he called Faraday into his room to show him the interesting spectacle within the crystal and while busily engaged in arranging the necessary apparatus for viewing the crystal,



A Model Gives One a Complete Understanding of the Building From all Sides.

than can be had from the most elaborate drawings of the architect—indeed, the architect may greatly improve his plans, in many instances, by first making a cardboard model of the design he is planning. Invention—discovery—in fact, all advances in art and in science—are but processes of visualizing, in the mind's eye, certain ideals or forms, and these tentative ideals, or forms, are expressed, as far as possible, in visible expressions. Tangible forms, though crude, are powerful aids to the perfection of our designs and inventions. Michael Faraday, Professor of Physical Science in the Royal Institution of Great Britain, was, perhaps, the greatest experimentalist of all history

Faraday took him by the arm and said, "Say, Tyndall, what am I to look for?"

And so, in determining the design of a house, the builder and owner, as well as the architect, would like to know how the house will appear after it is built and, undoubtedly, the cardboard method affords the best known means of securing this desired result. In making of such models various improvements will frequently, if not invariably, be made which would not be made by the drawing process; besides, as already indicated, the builder or architect may materially increase his patronage by using these cardboard models of houses and surroundings.



# Ready Made Plans

*Ben F. Cobb*

**T**IME was when the architect looked with jealous eye upon the ready-made plans for house builders. This was but natural, for all good things are frowned down to begin with. Today an architect must be very narrow minded who does not realize that the ready-made building plans are beneficial to him rather than otherwise. The ready-made plans educate home builders up to the standard of architects.

Let us go back a few years to the time when ready-made house plans were comparatively unknown. I have known of men coming into a lumber yard, extending a hand each way and saying, "I want lumber for a house of about three rooms. I want the lumber sent out and then I will get a carpenter to build it for me." The lumberman, if he was of the right sort, would make a few lines on a piece of paper, finding out about the size of the rooms wanted, and the sale would be made.

After the lumber had been delivered and the carpenter had arrived there would be sure to be a change in the size or shape of the building, for they would not even have the lumber dealer's few straight lines to go by, and there would either be too little or too much lumber sent, and possibly the kind would not suit the carpenter. The house would be built, however, and the starting point would be the three rooms needed and the result would be one more shack added to the numberless ones that when finished were "without form or void." I doubt if I know what that phrase means but it is in the Bible and must be all right.

Today, when a customer comes into a lumber yard and makes the same kind of a break about wanting to build a three-room house, the dealer reaches down under the counter and brings up two or three house plan books. Then he shows the customer one that fills the bill. The customer invariably asks if the carpenter cannot

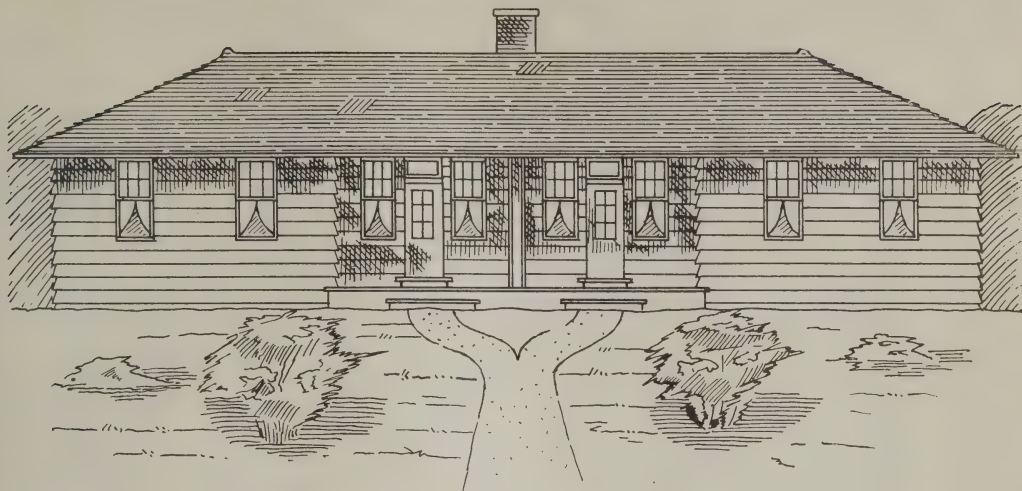
build the house from the pictures instead of sending for the blue prints and specifications, but the lumberman usually encourages and advises the purchase of the plans because in his experience it is more satisfactory both to the customer and to himself.

Building from plans is an education in the house building line, and when the time comes when this same customer wants to build a better house and cannot find his ideas fully carried out in the ready made plans he will apply to an architect to plan one according to his advanced ideas. Suppose a man wanted a reasonable priced house built for two families. He has a vague idea of what he wants and when plans like the one presented here is brought to his attention he is struck with the completeness of it. He can be assured of this, all the plans furnished by the NATIONAL BUILDER are drawn by first class architects, and unless an owner has an idea that he wants a home different from anything that anyone else has, or wants something different from what he can find in the plan books, he can be well suited by securing a ready made plan.

Every man, woman and child has a desire for some kind of a home and it is safe to say that there is not a book printed that attracts more attention in the average family than a house plan book, especially is that true of the women members of the family.

However proficient an architect may have become he has to take off his hat to the women when it comes to planning a house for convenience. This is not strange for it is the woman that takes care of the house and it is she who would naturally know what would lighten her work and would add to her comfort. She might not be able to draw even the floor plan but she can tell how the rooms should be located, where the sink, the stove and all other pieces of furniture should be placed to make it more convenient, and when the house is finished she has as many ideas as to planning the grounds as an experienced landscape artist.

This is the first of a number of homes especially designed for Summer homes and suitable for either the large or small camp in the mountains, by the lake, or sea shore. Another of the series will appear in an early issue of the NATIONAL BUILDER.



A Two-Family Summer Cottage.

L. E. Russell, Architect.

I desire to call your attention to the size of the kitchens in this double house. The chances are that a woman suggested the change from the old time kitchen, big enough for a game of basket ball, to the size that does not require her to walk fourteen blocks in order to get dinner. It is the little annoyances of life that hurt us the most, and it is the little conveniences that, like the little words of kindness, that make life worth living. Among the little conveniences I call the small kitchen well worthy of consideration.

Far be it from me to want to force my ideas or convictions on anyone for I am sure the small kitchen is something that many people have to be educated up to the same as eating raw oysters or Russian

caviar. I am here to contend, however, that the small kitchen is a wonderful labor saver. One four feet by six in which the housewife can stand in the center and reach nearly everything in it is the acme of perfection for the woman who is obliged or one who prefers from choice to do her own work.

The space cut from the old style kitchen is today added to the living room which is quite natural for in the days of our boyhood, provided our boyhood was spent on a farm or in a country town, the big kitchen was often the only room in the house that was used except the bed rooms. Some of us have not outgrown our provincialisms in that direction for we still stick to the large kitchen and eschew Russian caviar.



Floor Plan of a Two-Family Cottage.



# Store Front Designs

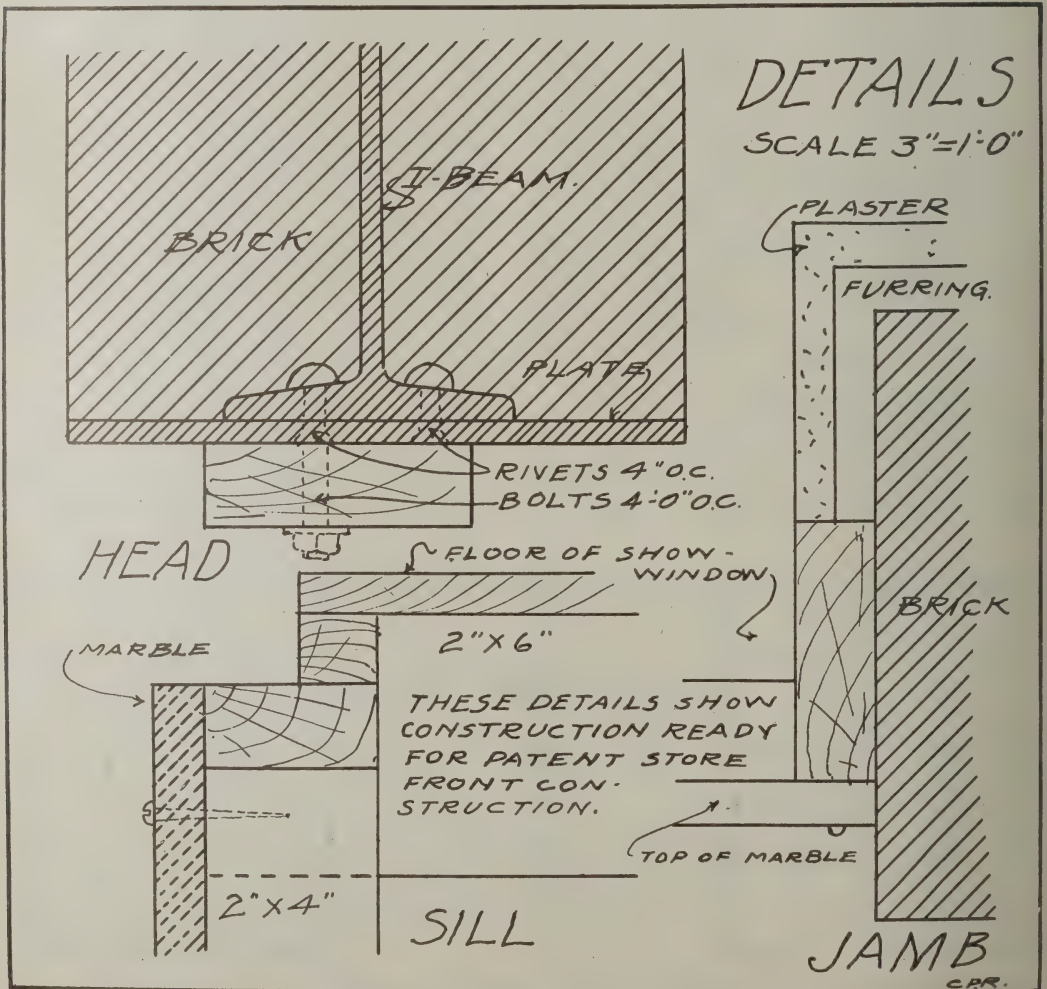
*Chas. P. Rawson, Architect*

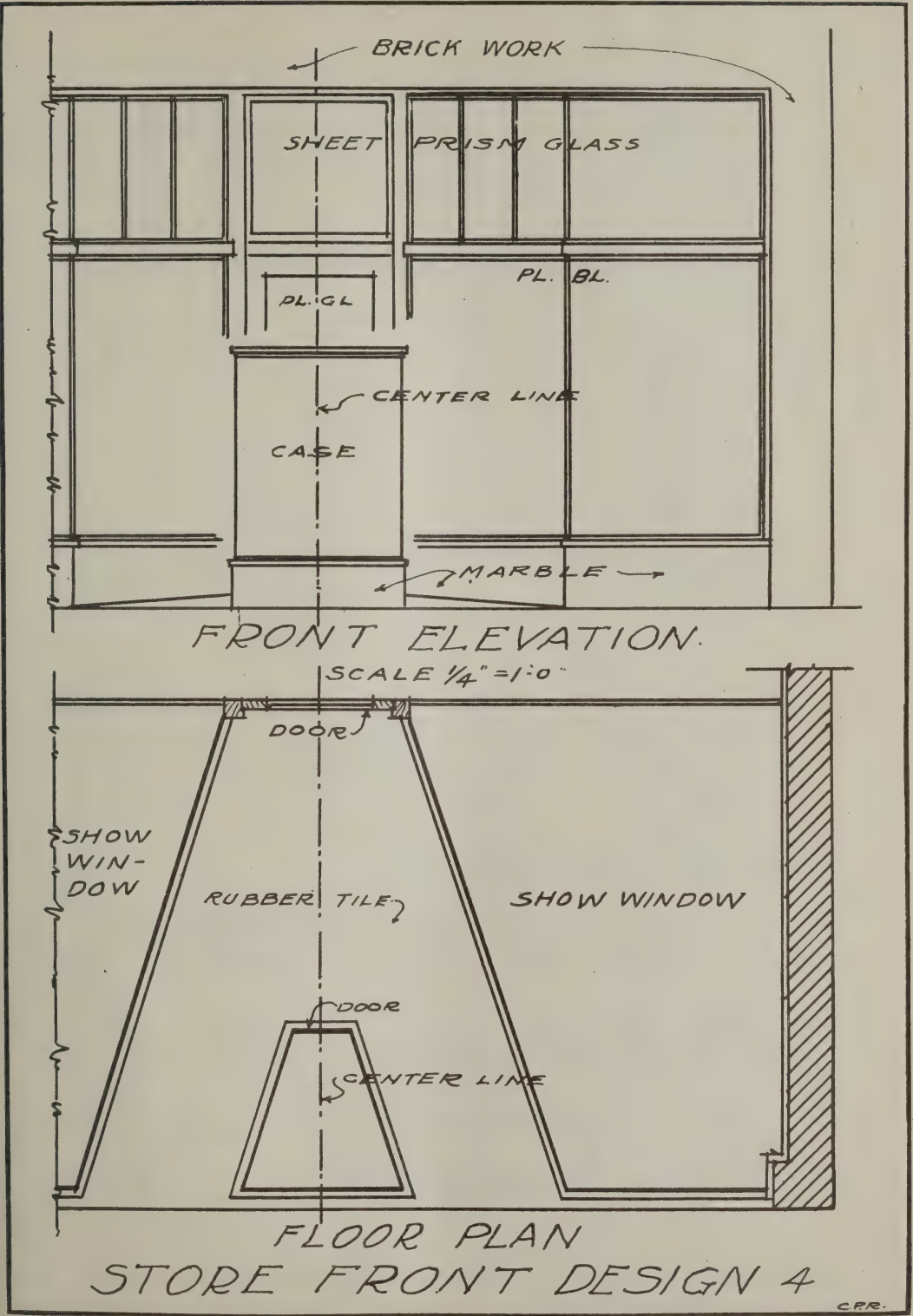
**T**HREE designs of modern store fronts adapted to the use of patented store front construction together with details which will fit any of the three designs are shown this month. These fronts may be used in either new buildings or in those about to be remodeled. A modern store front will pay for itself by the sales it creates. It means much as an advertisement and works every day in the year.

All of the designs are drawn to the scale of one-fourth inch equals one foot and the details to the scale of three inches equals one foot. Design 4 shows a deep

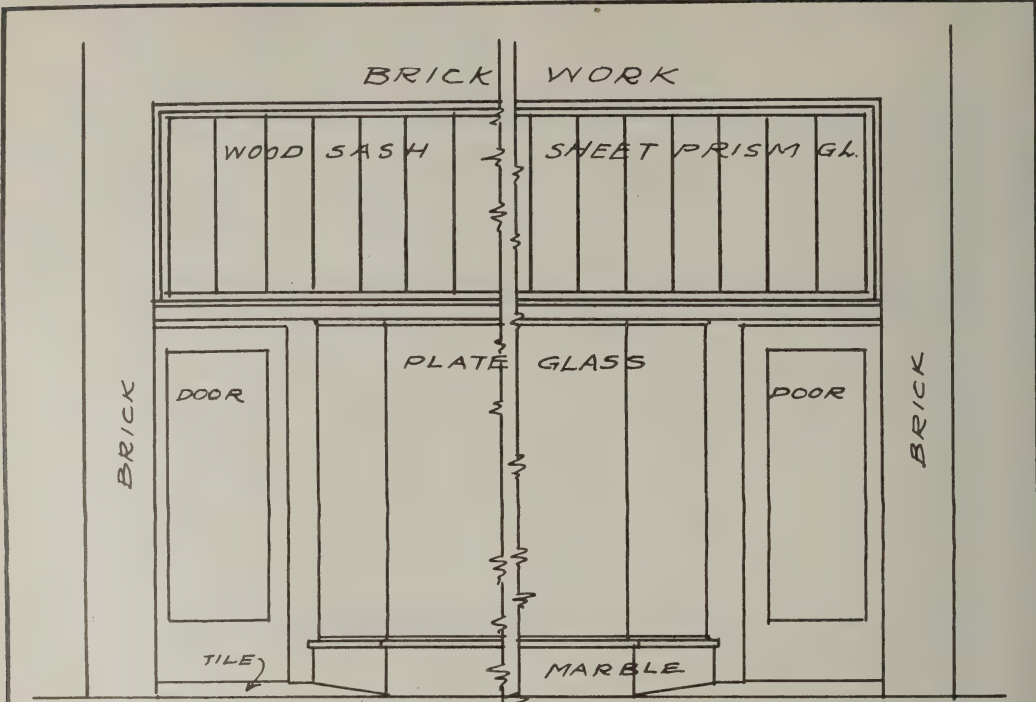
window with a central show case. Such a front is desirable for a clothing and furnishing store. The transom follows the line of the lower glass. Such windows should have paneled backs.

Design 5 is one to be used in connection with an entrance to the second story. The transom is continuous and all of it is used to light the store, the stairway receiving light from the door only. Design 6 shows a good arrangement for a corner store, preferably a drug store. The corner column is exposed up only to the transom bar.

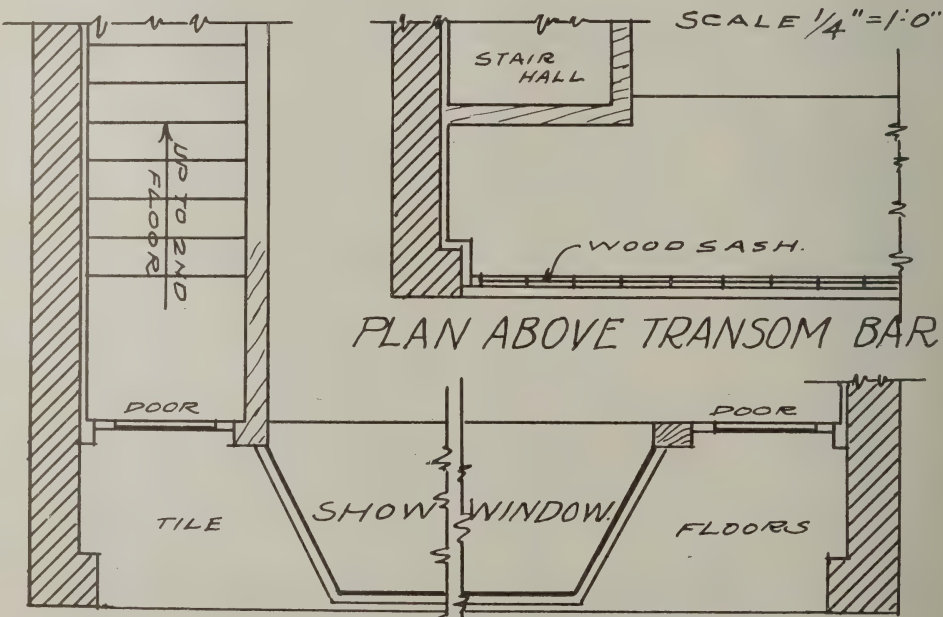








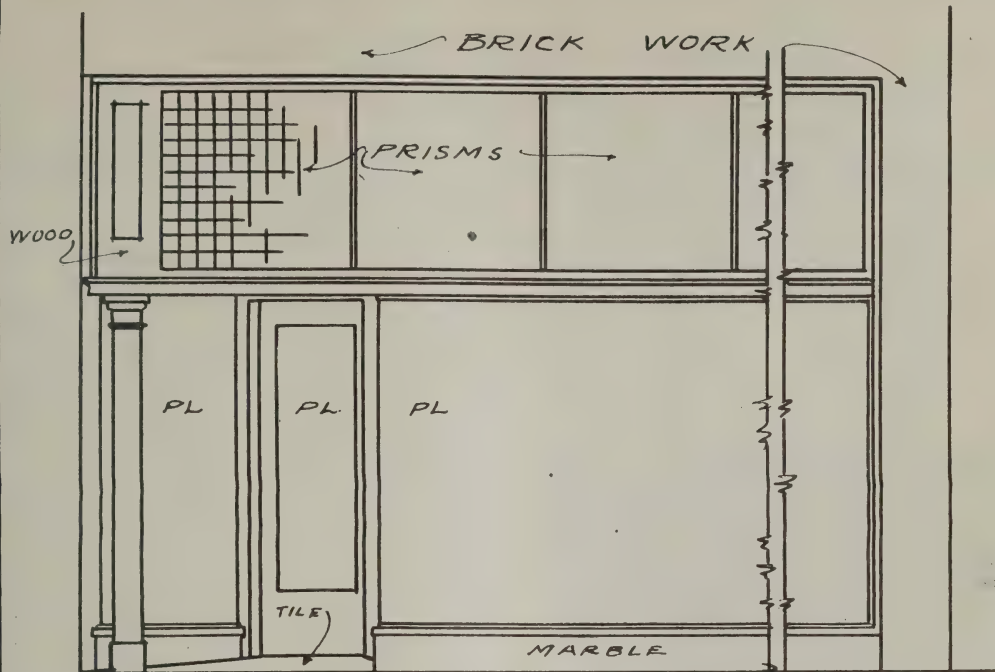
FRONT ELEVATION



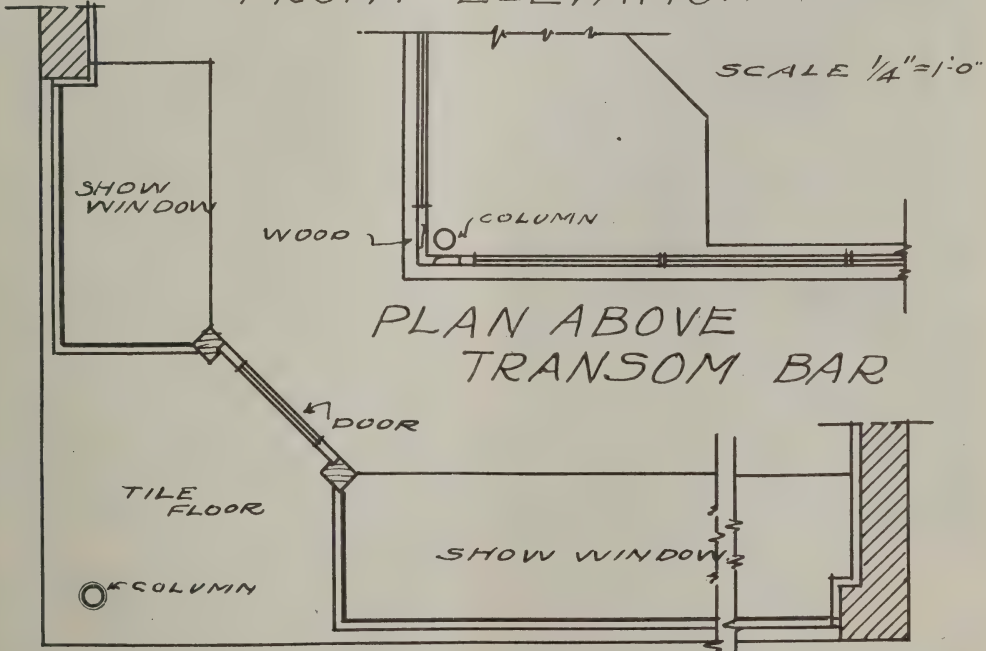
PLAN ABOVE TRANSOM BAR

FLOOR PLAN  
STORE FRONT DESIGN 5.

C.R.R.



FRONT ELEVATION



FLOOR PLAN  
STORE FRONT DESIGN 6 CRR.



# Farm Improvements

Henry B. Reed

**W**AR in Europe, the advance in standard food stuffs in large cities, and the fact that grain, cotton and other staples are constantly advancing tends to give American farmers high prices for their huge bumper crops. In previous articles, the prosperity of the American farmer, particularly in 1914, has been spoken of, and the farm contractor should not lose sight of this important fact, to him.

have developed profitable business already. Another phase of this important question will now be presented.

## HEALTH AND COMFORT IN THE COUNTRY FARM HOUSE.

Perhaps the contractor, and the farmer, too, will be inclined to scoff at the idea that the farm house can be made more healthy and more comfortable. Hasn't the farmer all the fresh air in the world, pure water, plenty of vegetables, milk, etc., and ideal health surroundings? As the old missionary hymn goes, "only man is vile," and this is literally true in the country. Sanitary conditions are being improved, electric lighting, acetylene gas lighting, and other systems are being put in, and methods of supplying water under pressure are being installed on the more prosperous farms. The supply of pure air may be unlimited *outside* of the farm house, but the question is get some of it *inside*. Like the Ancient Mariner adrift on the ocean, "water, water everywhere, but not a drop to drink." It is up to the farm contractor, by means of sleeping porches, outside dining rooms, well constructed doorways, porches, etc., to get fresh air on the inside of the farm house, and incidentally, show the farmer and his family the advantages of fresh air. It is a deplorable fact that there is more consumption per capita among farmers than there is among the city dwellers. It is an even more deplorable fact that on hundreds, even thousands, of American farms the most modern machinery and sanitary methods prevail in the handling of crops and live stock in the fields and barns, yet the question of convenience, comfort and health in the farm house itself is neglected. This, of course, gives a wide and rich field for the farm contractor to work.

The farmer's wife and daughters are generally the best means of attack for farm house improvement, and strategy should be used. Plans should be made beforehand, and the contractor should figure out as he rides around in the country whether the farmer's wife would be pleased most with a sleeping porch, some outside work like a



Figure 1. An Attractive Hood or Rain Shelter for Either a Front or Side Door.

Reasons why the contractor in agricultural communities should reach out and become a farm contractor have been dwelt on at length in previous articles. It is assumed that wide-awake contractors have already profited by these articles. No doubt many

trellis around a window to take care of an unsightly vine, which by means of the trellis can be made attractive, or whether an outside dining room with a sleeping porch on top would be the best point of attack. Frequently in the rear of a building, if it faces north and south, or on the west side such an addition can be made next to the kitchen. Do not build a sleeping porch on the east side of the house, as, although it will be cooler than the west side, the sun will wake up the sleepers too early. It may be that many farmers are getting up at three and four o'clock (although this is principally bunk) but there is no reason why the younger children of the family should get up at that time, and if any of them are younger than four years, their imitations of Caruso may not be welcome at 3 a. m. The sleeping porch, in addition, is of great value for company, city relatives, summer boarders, and adds greatly to the selling value of the farm, and very much to the health and comfort of the farmer and all his family. As a dollar and cents proposition, it pays the farmer, in reducing the doctor's bills, and not only makes conditions more comfortable and healthful, but adds greatly to the farmer's efficiency as a worker, and efficiency of all the members of the family. If the farmer is located in the corn belt, he may find that even a very simple and comparatively cheap sleeping porch built on the house or houses of his farm hands will not only make them better satisfied, and more easily kept on the farm, but in addition they will be able to do more work. This point is one which should strongly appeal to the average farmer, and should not be overlooked by the contractor in setting forth the advantages of such improvements.

#### CAREFUL SELECTION OF WOOD DESIRABLE.

It has been commented on, but will well bear repetition that the contractor, of all people, should not go to the lumber yard, and just get a number of 2x4's, 2x6's, and various sizes of lumber that the dealer may wish to dispose of first, neither should the contractor lose sight of the great advantage he has in airing a little special knowledge of woods most suitable for special purposes. Cypress, redwood, red gum, both sap and heart wood, Washington red cedar, Douglas fir, and the old reliable white pine are some of the woods which have special uses, and

which can be used separately or together to the contractor's and the farmer's advantage. For the purpose of giving the contractor more ammunition to shoot at the farmer, a few of the characteristics of these woods will be briefly given. The illustrations accompanying this article are well worth the study of the contractor, and can be used advantageously in showing the farmer the possibilities of improvement along the lines of this article. The author is indebted to the Southern Cypress Manufacturers Association for these illustrations.

#### CYPRESS.

Cypress is the wood most commonly thought of nowadays by the average Amer-



Figure 2. A Hanging Sleeping Porch Which Can Be Added to Practically Any House.

ican when exterior improvements are contemplated. That this is because of the nation wide advertising campaign carried on by the cypress advocates, as well as the inherent excellence of the material itself cannot be doubted. Cypress is one of the oldest known woods, is spoken of by Shakespeare, by Milton, and is mentioned in the Bible. Pliny mentions cypress doors which were good after six hundred years; Heroditus and other ancient authors mention it also. Some good authorities believe that the "gopher wood" of which Noah made his famous ark was cypress. Isaiah, chap-



ter XLIV, verse XIV says, "He heweth him down cedars, and taketh the *cypress* and the oak." Cypress is commonly supposed to be of two kinds, white and black. All dark pieces are called black cypress. Sometimes cypress comes in a slightly tinted color, and then is divided into red or yellow. Ordinarily, however, the seasoned wood resembles white cedar. Cypress is soft, light, easily worked, and very durable. When used outside, it need not be painted as time will produce a beautiful weathered effect, but if stained, green or brown are the most popular colors. Because of its endur-



Figure 3. An Outdoor Dining Room Which Could Also Be Used as a Sun Room.

ing properties, it is generally used for outside work. If cypress shingles are used, zinc or copper nails should be used, otherwise the shingles will outlast the nails.

Speaking of shingles, it should be remembered that first, a well nailed shingle roof is not likely to catch fire, and second, that there are many fire-proof or fire retarding paints on the market which should be used on all shingle roofs. However, if well seasoned shingles are used, and are well nailed with zinc or copper nails, the fire hazard will be greatly reduced.

#### REDWOOD.

Redwood is another excellent wood for shingling roofs, and for both outdoor and indoor work. The Big Trees of California are redwood, and California is the only state in which this wood now grows. It is supposed that redwood once grew all over the United States but the glacial or ice age killed them off except in California. Redwood is a reddish brown wood, and does not burn readily. It is probably the most fire proof of all woods. The heartwood is coarse, straight grained and red or of a reddish brown. The sapwood is nearly white. Redwood is a light, durable wood, works well, and stands well, and is used on the Pacific coast largely for shingles, and also in the huge wooden pipes that carry water for irrigation purposes. It is sometimes called curly redwood, and in interior work is often used in imitation of mahogany.

#### GUM.

Red gum or sweet gum is a member of the witch hazel family, and should not be confused with the sour or black gum of the dog wood family, which is planted frequently in the south because of its bark.

Sour gum is not a commercial possibility as it is very difficult to work. Sweet or red gum has a number of names, depending on its locality, it being called alligator wood in some localities. The heartwood is a rich brown, and for interior finish is more fashionable and popular than walnut used to be, and in fact, is sometimes called satin walnut. Sap gum is not so expensive as the heartwood, and is almost an ideal wood for a white enamel finish. This wood opens up great possibilities for the contractor for interior work, sanitary kitchens, extra or company bedrooms, the interior of outside dining rooms, etc., and looks very well in white enamel. Just now there is a popular movement in favor of sanitation, and rooms finished with sap gum and enameled, will certainly make a reputation for the good farm contractor.

#### RED CEDAR.

Washington red cedar has a very desirable use for closet lining, closet drawers, cedar chests, clothes boxes under built-in windows, the lining of linen closets, especially, and can also be used for portable clothes boxes on rollers, to be slipped under

the bed. There are other uses for this very desirable cedar, but the uses outlined above are of especial interest to the farmer's wife and the farmer also, as moths eat his clothes too. A most excellent start can be made in any farm house by suggesting the use of red cedar for keeping out moths, preserving clothes, and thus conserving the farmer's money as well as making things in the farm house more convenient.

#### DOUGLAS FIR.

Douglas fir is a wood best used, perhaps, for exterior construction. It is not, strictly speaking, a fir, but closely resembles larch or hard pine. For all heavy construction, for floors, for sleeping porches, beams for bracing and holding, this wood will be found highly desirable. Preach to the farmer the railroad motto of "Safety First," and assure him that Douglas fir is one of the best woods for beams and columns, and this additional factor of safety should make him think well of the contractor. Douglas fir is a hard wood, the sap wood is nearly white, and the heartwood light red and yellow. It is a durable, unusually hard and strong wood, and while difficult to work, it is one of the best woods for the purposes just outlined. Lumbermen divide Douglas fir into red and yellow—dark and coarse. The yellow is generally most desirable. Douglas fir is considered to be about twice as strong as yellow pine, and is much easier to work.

#### WHITE PINE.

White pine was once the most important tree in North America. If the farmer cares to pay the extra cost, this standard wood is well worth using, and the dealer can get the genuine stuff if the contractor insists. As all the older contractors know, the heartwood of white pine is cream white, the sapwood almost dead white. White pine has a close straight grain, and is free from knots and resin.

#### STUDY THE ILLUSTRATION.

A great philosopher once remarked that "speech was given to man to conceal thought." Be this as it may, the fact remains that the contractor should have something definite and tangible to say to the farmer. The farmer is a practical man, often without much imagination, and the contractor must picture to the farmer the

advantages that the improvements will be to him. The value of making suggestions as to improvements to different members of the farmer's family, especially the women, cannot be over estimated. As the con-

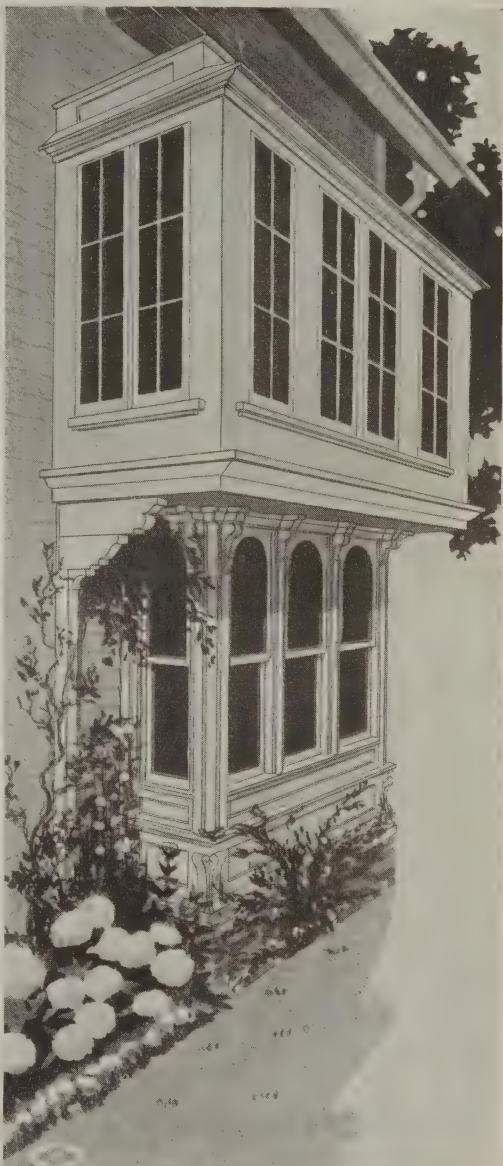


Figure 4. A Combined Sleeping Porch and Dining Room or Sun Room Front.

tractor strolls through the farmhouse, he can casually remark that "here is a good place for a built-in window or if this kitchen was finished with sap gum and enameled, it would be easier to clean, and be very at-



tractive or the front porch could be improved with a new floor of Douglas fir, etc."

Take Figure 1, for example. This represents a very attractive hood or rain shield for either a front or side door. Such an arrangement is handsome enough for a front door, and on the other hand, most of the farmhouses in the United States would be improved about a thousand percent by having such an entrance to the kitchen. After all, the kitchen entrance is often the one most used, and there is no reason at all why considerable thought, time and money should not be spent in improving it.

The hanging sleeping porch, illustrated by Figure 2, is one of the most practical forms for this much needed improvement. A porch of this kind is easily built, and secures the maximum amount of fresh air, and also the maximum amount of privacy. Such a porch is well adapted for almost any type of house, and can easily be built in. Do not neglect the trim on the lower window, and also remember that oftentimes improvement of this kind will lead to the repainting and the improvement of the entire farmhouse. Do not overlook the planting of vines around such improvements. Virginia Creepers, wild grape vines, Boston ivy, Climbing Honey-suckles, and other hardy and beautiful plants can be purchased (two year old stock for immediate effect) at an average price of fifty cents. After the muss of rebuilding has been cleared away, a hole should be dug a couple of feet deep. Good soil mixed with a handful or two of manure can easily be obtained. Five minute's time and fifty cents can hardly be invested to better advantage by the contractor.

The outdoor dining room illustrated by Figure 3 may look very stylish and ambitious. The contractor should not be dismayed, and should remember that a good design does not necessarily mean ginger bread work. A little study will show the simplicity as well as emphasize the beauty

of this design. An outside dining room of this kind is one of the crying needs of most American farmhouses. The contractor should notice the fact that all these designs are extremely practical, and are well worked out.

The combined sleeping porch and outside dining room, shown in the fourth illustration, Figure 4, is a little more involved than any of the others. It represents, however, an economy of materials and space. The contractor should read the July article on concrete silos, and remember that the instructions given for the mixture and general method of making a good concrete foundation, will apply to a considerable extent to the foundation here.

This design allows the contractor to exercise considerable ingenuity in the selection of materials. He can use cypress throughout or he can make the beams and other supports of Douglas fir. Cypress can be used for all other exterior parts, and the interior finished with sap gum in the dining room and enameled. Redwood can be used as interior trim in the sleeping porch upstairs. Other combinations of these woods can easily be figured out. The use of a variety of woods, if suited to the purpose, will naturally please the farmer better than if just lumber is used.

These articles have been written with a sincere desire to show the contractor in agricultural communities his opportunity for branching out, and getting his share of the prosperity which, contrary to the president's idea, "will be passed around." No legitimate prosperity was ever passed around on a silver platter. The contractor must go out, and hustle for the business, and use his good sense and ingenuity to get his share of the farmer's business. There is a strategy of peace as well as war, and because a man is honest does not mean that he must be stupid. Honest schemes for getting business are necessary for the contractor as well as any other successful business man.

"You say you were once the editor of a newspaper?" asked the lady of the tramp.

"Yes, lady, and it was a very bright little sheet, if I do say it."

"How does it happen that you are forced to ask at back doors for your meals?"

"It is merely a case of the irony of fate.

I had a printer who was near-sighted, and one afternoon he got a wedding notice and a murder trial mixed, so that after describing the costume of the bride it said the condemned man almost collapsed when sentence was pronounced."—Chicago Record-Herald.



A Southern Bungalow.

W. R. Gilbert, Architect.

## Economize Space

*Ben F. Cobb*

**D**ID it ever occur to you that people are becoming more sensible as years roll on in regard to economizing space in building homes? I mean the real people like you and me, not the people who think they must have an overgrown house, to show that they have more money than they know what to do with, who build real homes with no extra room to keep clean while the space is going to waste.

I once knew a man who built a one story house with eighteen rooms. His wife had often complained of the stairs so one time while she was away on a visit he built the house to give her a pleasant surprise. It must have been a surprise, for the rooms were large and the roof was neither a "thing of beauty nor a joy forever." It certainly was a good piece of engineering to cover those eighteen rooms with a roof. There did not seem to me to be any excuse for those eighteen rooms, as there were only four in the family, but they had been accustomed to a large house and it had never occurred to them that they could live in a smaller one.

Speaking of large houses, I had one pointed out to me in Seattle, Wash., that I was informed had a hundred rooms in it. The gentleman who had it built made a fortune in Alaska and possibly had never owned a house large enough to suit him. At the time it was called to my attention his widow was living there alone with her servants. Poor woman, just think of it! One hundred rooms to keep in order and too rich to keep roomers.

I could never see any comfort in an overgrown house. To me there is nothing homelike about it. It always reminds me of the immensity of space. You go from one room to another and wonder what is beyond.

Some wise guy is always reminding us that "One-half of the world does not know how the other half lives," but we do know that hosts of them live at the extreme. One extreme being the widow and her servants living in her hundred rooms, and the other where twenty or thirty people are crowded into one room. Let us be thankful that there is a happy medium, such as the house we show with



this article, or rather the class of people that usually live in this class of a home.

If you will look this plan over you will find no waste room, neither will you find any dark rooms. The architect who planned this house certainly appreciated the fact that light and air are of the best of the gifts of the Creator.

While looking over this plan I was impressed with the fact that people are becoming more sensible in regard to economizing space in home building. It is probably due to the fact that the architects have been catering more to people in medium circumstances. If the credit belongs to the architects, they are deserving of a good measure of praise, but in my opinion the housewives must have helped some, for the average housewife who understands housework is quick to take advantage of anything that saves labor.

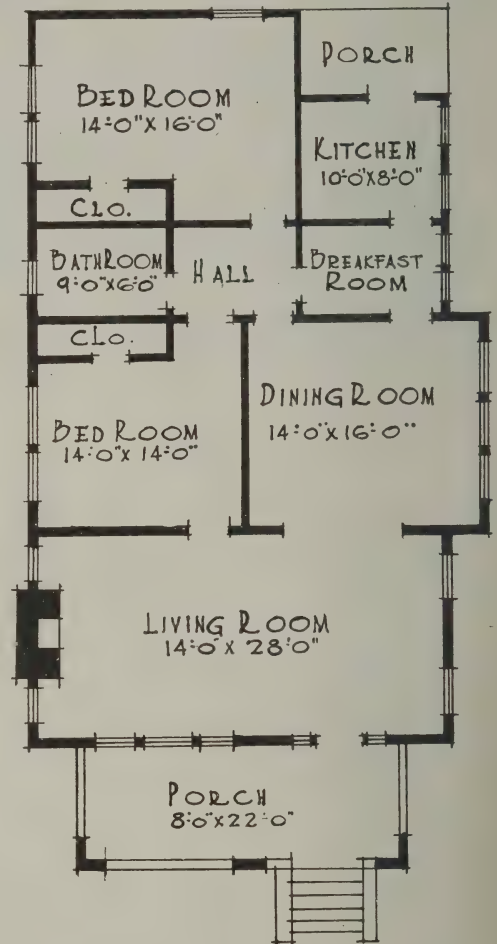
Extra rooms mean extra work, and while the man of the house might say if you have extra rooms or rooms that you do not use, shut them up, what good housekeeper would consider such a thing for a moment?

I once mentioned to a lady that it was nice to have a guest room, and although not thinking to make a pun, she said, "guess again." Then she added, "those who come to see us are glad to put up with the davenport in the living room, but those who come for a rest want a guest room."

In the plans shown here the breakfast room might be pressed into service as a guest room, but why worry about guests or mothers-in-law as long as the home is sufficient for the family, that being the purpose of a home?

In looking over this plan one cannot help but feel that, whoever the real designer was, the comfort of the owner was uppermost in his mind. The rooms are all so nicely proportioned. The kitchen is small, carrying out the up-to-date housekeeper's idea that a small light kitchen is the acme of perfection in that line. The bedrooms are fair sized, light and airy. The dining room is large and far enough away from the kitchen to lose the odor of the cooking—but wait a moment, a good cook must have some gray matter, and if she will use it she does not

need to perfume all of the house with cabbage and onions. I have before now visited an eight-room apartment and found every one of the rooms impregnated with the odor of the dinner that was being prepared, and it is hard to make excuses for anyone who is so careless, for it is quite



Floor Plan.

easy to ventilate a kitchen so that this is avoided.

This plan shows one other room that is worthy of mention—the living room. Light and airy it must be, for there are windows on three sides. For summer it is ideal, and for winter, with the fireplace for cheerfulness, and the furnace for heat, it is a perfect home for any climate.

How prone we are to put the best foot forward, I mean the best of us, the ones

who have the most self-respect. Just look at the photograph of this elevation. Before the photographer got in his work the plants were looked over to make sure that they showed up to the best advantage.

We take it for granted that this house is being lived in, but a wise builder, an architect, or even a man selling house-plans would learn a lesson from this picture. The lesson is, when you have a house that you want to show off by photographing the same, have some life in the picture. If the house is unoccupied, borrow some plants, put up some curtains, have your wife play she is at home on the porch, and if you are shy on children, borrow two or three and have them play on the lawn while you have a good photographer take a snap of the whole.

When I say a good photographer I do not necessarily mean a professional. All there is to taking pictures in the open is to get a person to handle the camera who has had some experience and understands

lights and shades. All that is needed for an outside picture is a snapshot, while an interior is a different proposition for the reason that an interior picture requires a time exposure, and it takes both judgment and experience to tell how much time is required.

However, I do not propose to write a dissertation on the art of picture making. All I want to say is, in taking a picture of a house be sure to have some life in the picture. Did you ever see the picture of a beautiful landscape without animal life in it? Of course you have and no doubt wondered for a moment what it lacked. If you are enough of an artist you will realize that it needs something in the foreground. Let the artist paint in a picture of Whittier's "Barefoot Boy" and you have enhanced the value of the picture a thousand per cent. Do not forget this when photographing your own homes, or when looking at the photograph of one you think you would like to own.

## Measuring and Estimating by the Painter

*A. Ashmun Kelly*

WHEN a number of average leading master painters were asked to guess on the number of square yards of painting that a certain building contained, and gave their guesses, after a careful survey of the work, it was found that they ranged all the way from 598 to 1,033 square yards. The work measured 791 square yards, or just about half-way between the lowest and highest guesses. It is evident that the low bidder would have lost money, and the high bidder would have lost the contract. It will also be noted that a little more than half the guesses were under, not over, the actual measurement. This little experiment is full of significance. The painters were men well up in their business, and some of them did work right along on the guess plan. Most of these men had had much experience in estimating, too.

It is necessary to measure the work, carefully; that is not all, either. If architects' plans are to be read, then there

are other things to be done besides measuring. Architects differ in their specifications for millwork. Different scales may be used, or there may be a difference in working out mouldings having the same dimensions. Where a painter has the one architect only to work under he will become acquainted with his style and methods, and will be able to measure more accurately. Another thing, he cannot read the specifications too closely, in order to understand exactly just what will be expected of him. Many things there will be to do that the painter gets no hint of in the specifications, such as mantels, for instance, that may be placed by the owner of the building, but which the painter will be expected to paint or otherwise finish. And the owner may not wish to pay him for it. Another matter is the finish; this may be paint or hardwood finish, plain paint, or enamel paint. And all this will make a great difference in the cost of doing the work. There may be storm doors,



storm sash, panel backs and boxes for inside blinds, hall and window seats, drawers, dressers, shelves, bathroom and storeroom accessories, and so forth, all to be done but no hint of same in the specifications.

It is a good plan for the painter to look over the specifications of the other mechanics, for here he might find something to interest him. And as there are various finishes for woodwork he ought to ascertain certainly just what finish or finishes are required. Or take wood finishing alone, there are cheap and costly finishes; he should know just what sort is to be followed. Ascertaining also whether he is to furnish the glass or is only to set it and glaze it. How many coats of paint or varnish? What kind? Woodwork to be primed before or after being put up? Picture mouldings to be painted? Any painting or whitewashing in cellar? How about the radiators? Walls and ceilings to be done in oil or water paint? Any decorating? Shingles to be stained? If so, how? Dipped only or dipped and brushed? These are a few of the many little items that must be looked up if the painter does not want to lose on the contract. The architect meant to put every little item down, but did not, that is all.

Then there is the surface, its character. It makes a vast difference whether the surface is smooth and solid, or rough, or porous, or in bad condition. A poor surface will take more material and more time. Again, there is the getting at the work, whether it is easy to get at, or requires much scaffolding. And don't forget that while it costs to put up scaffolding, it also costs to take it all down again. Count that in. Moreover, a man will not do as much work in a day at an altitude as on or nearer the earth. It not only consumes time getting up to the work, but he cannot work as well, as a rule, when at an altitude, owing to natural

fear. As a general thing, all exterior work requires more time than the same amount of interior work. Take roof work, for instance, or any scaffold work. So it will be seen how many little items have to be looked after in the making up of an estimate of painting. Many carpenters, large or small contractors, do the painting, employing hands for the purpose, and these will be interested in what I have been calling attention to.

But after every detail of the work is in hand, every foot of surface put down in figures, what then? What shall the charge be? And if the workman has no answer his array of figures of measurement will be of little use to him. He must know what it is worth to paint or otherwise finish each square yard of surface, each lineal foot of work, both for work and material furnished. It is just as easy to make costly mistakes in setting prices as in faulty estimating. But the same cost price will not do in every locality, as the cost of labor at least varies greatly with localities. But you can take your own local cost of labor and materials, and having a proper idea of how much the men do in a day, make some approximate estimate of what to charge; being careful always to aim a trifle high. For there must be provision made for profit, even should this item cause you to lose the bid.

Reverting to the matter of guessing, it would have been easier for those painters to have guessed what it would be worth to do the entire job, in lump form, than to guess how many square yards it contained, for so many jobs are, roughly speaking, about the same that when one has done one such job it is comparatively easy for him to guess on another one. Much work is done upon this plan, and it may be said that the results are usually good, but at the same time this is not an exact nor desirable method, and will not do where many are bidding.

A provision of a building contract for the withholding of twenty per cent. of the price until fifteen days after completion, declaring that such sum should be held by the owner as security for the faithful completion of the work, and might be applied under the direction of

the architect in liquidating any damages sustained by the owner, did not constitute an agreement that any estimates by the architect of the damages sustained by the owner because of the contractor's breach should be binding on the parties.—*Funk v. House*, 168 S. W. (Tex.) 481.



This Bungalow Would Attract Attention Anywhere on Account of its Pleasing Detail.

## A Popular Bungalow

*Jud Yoho, Architect*

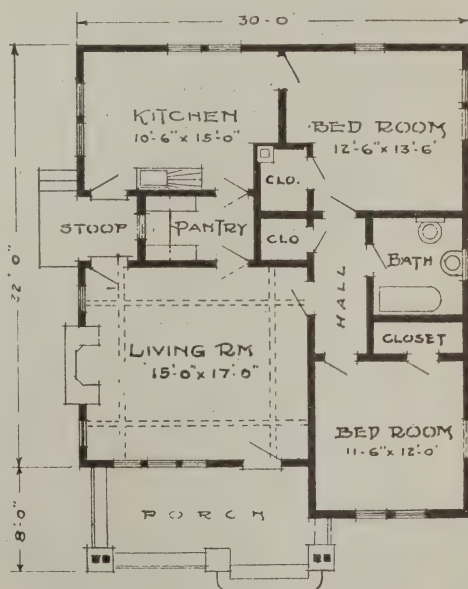
**T**HIS is one of the most popular low priced bungalows and has the appearance of costing several hundred dollars more than it really does.

The architect's treatment of the exterior, the siding of 6-inch and 12-inch rustic boards alternate, the brick of the porch piers and the cement of the chimneys is fine and the unique touches in the divided verge boards, the plaster panels in the piers and the belt around the chimney top show the care with which the design was thought out.

Avoiding a stuffy vestibule, entrance is made directly into the living room. The house has only four rooms, but all are of good size and provide ample space for a small family.

The finish in all the rooms is the simple Craftsman type of square edge boards unspoiled by the addition of fancy mouldings. The plaster walls can be tinted. The pantry is well equipped with cabinets, drawers and bins or if desired one can change this room to a breakfast room with cozy built-in seats and table and build the cabinets in the kitchen. A very pretty mantel of brick built on scientific lines throws all the warmth of the blaze into the room and all the smoke up the chimney. The more the plan is studied the more one appreciates the conveniences of

this compact little home. The house has no basement and is built on concrete piers. This makes a very satisfactory foundation, being as permanent as the rest of the



Floor Plan.

building, and entirely getting away from the troubles which follow the use of wood posts under either the walls or interior partitions.



# How to Estimate

I. P. Hicks

## Second Article

IN estimating framing lumber, it is quite a convenience to have at hand a handy table showing the number of feet board measure in the dimensions of all the different sizes of timbers commonly used in the construction of buildings. The following table is our Handy Ready-Reckoner Timber Measure Table.

The following table is arranged for use in finding the feet board measure from the

NUMBER OF FEET BOARD MEASURE IN A SQUARE OF FRAMING ALLOWING FOR DOUBLE PLATES IN OUTSIDE WALLS AND PARTITIONS, AND ONE EXTRA STUD OR JOIST PER SQUARE FOR DOUBLING, HEADERS, AND 1x4 BRIDGING.

- 2x 4 outside walls, set 16-in. centers..... 72 ft.
- 2x 4 partitions, set 16-in. centers..... 72 ft.
- 2x 4 ceilings, set 16-in. centers..... 64 ft.
- 2x 6 outside walls, set 16-in. centers.....108 ft.
- 2x 6 partition walls, set 16-in. centers.....108 ft.
- 2x 6 ceiling joists, set 16-in. centers..... 96 ft.

Ready Reckoner Timber Measure													
Length in Even Feet													
Size	8	10	12	14	16	18	Size	20	22	24	26	28	30
2x4	5⅓	6⅔	8	9⅓	10⅔	12	2x4	13⅓	14⅔	16	17⅓		
2x6	8	10	12	14	16	18	2x6	20	22	24	26	28	
2x8	10⅔	13⅓	16	18⅔	21⅓	24	2x8	26⅔	29⅓	32	34⅔	37⅓	40
2x10	13⅓	16⅔	20	23⅓	26⅔	30	2x10	33⅓	36⅔	40	43⅓	46⅔	50
2x12	16	20	24	28	32	36	2x12	40	44	48	52	56	60
2x14	18⅔	23⅓	28	32⅔	37⅓	42	2x14	46⅔	51⅓	56	60⅔	65⅓	70
2x16	21⅓	26⅔	32	37⅓	42⅔	48	2x16	53⅓	58⅔	64	69⅓	74⅔	80
3x12	24	30	36	42	48	54	3x12	60	66	72	78	84	90
3x14	28	35	42	49	56	63	3x14	70	77	84	91	98	105
3x16	32	40	48	56	64	72	3x16	80	88	96	104	112	120
4x6	16	20	24	28	32	36	4x6	40	44	48	52	56	60
6x6	24	30	36	42	48	54	6x6	60	66	72	78	84	90
6x8	32	40	48	56	64	72	6x8	80	88	96	104	112	120
8x8	42⅔	53⅓	64	74⅔	85⅓	96	8x8	106⅔	117⅓	128	138⅔	149⅓	160
8x10	53⅓	66⅔	80	93⅓	106⅔	120	8x10	133⅓	146⅔	160	173⅓	186⅔	200
10x10	66⅔	83⅓	100	116⅔	133⅓	150	10x10	166⅔	185⅓	200	216⅔	233⅓	250
10x12	80	100	120	140	160	180	10x12	200	220	240	260	280	300
12x12	96	120	144	168	192	216	12x12	240	264	288	312	336	360

lineal feet of timber, such as sills, posts, and girders. It is an advantage when the estimator does not care to figure out the different lengths required by the plans. Just take the lineal feet by the scale from the plans and figure as follows:

- 4x 6—figure 2 square feet per lineal foot
- 6x 6—figure 3 square feet per lineal foot
- 6x 8—figure 4 square feet per lineal foot
- 8x 8—figure 5 1/3 square feet per lineal foot
- 8x10—figure 6 2/3 square feet per lineal foot
- 10x10—figure 8 1/3 square feet per lineal foot
- 10x12—figure 10 square feet per lineal foot
- 12x12—figure 12 square feet per lineal foot
- 12x14—figure 14 square feet per lineal foot
- 12x16—figure 16 square feet per lineal foot

- 2x 8 ceiling joists, set 16-in. centers.....134 ft.
- 2x10 floor joists, set 16-in. centers.....166 ft.
- 2x12 floor joists, set 16-in. centers.....198 ft.
- 2x14 floor joists, set 16-in. centers.....230 ft.
- 2x16 floor joists, set 16-in. centers.....262 ft.
- 3x12 floor joists, set 16-in. centers.....394 ft.
- 3x14 floor joists, set 16-in. centers.....342 ft.
- 2x12 floor joists, set 12-in. centers.....222 ft.
- 2x14 floor joists, set 12-in. centers.....258 ft.
- 3x12 floor joists, set 12-in. centers.....330 ft.
- 3x14 floor joists, set 12-in. centers.....384 ft.
- 2x 4 rafters, set 16-in. centers..... 64 ft.
- 2x 6 rafters, set 16-in. centers..... 96 ft.
- 2x 4 rafters, set 20-in. centers..... 56 ft.
- 2x 6 rafters, set 20-in. centers..... 84 ft.
- 2x 6 rafters, set 24-in. centers..... 72 ft.

PORCH FLOOR FRAMING, INCLUDING DOUBLE OUTSIDE JOISTS AND OVERHEAD PORCH BEAMS OF SAME SIZE TIMBERS, TO SUPPORT CEILING AND ROOF.

2x 6 joists, set 18-in. centers.....	120 ft.
2x 8 joists, set 18-in. centers.....	160 ft.
2x10 joists, set 18-in. centers.....	200 ft.

BRIDGING

A square of framing where bridging is required will need 18 lineal feet of bridging which, reduced to timber or board measure, will be as follows:

- For 1x4 cross bridging, 6 feet.
- For 2x2 cross bridging, 6 feet.
- For 2x4 cross bridging, 12 feet.

LOOKOUTS

Where lookouts are required as the projection of ceiling joists for a level cornice, figure the squares for the ceiling to the outside of the cornice where all such projections occur and there will be enough timber to make the lookouts.

A square is 100 square feet.

WHAT IT TAKES OF DIFFERENT MATERIALS FOR A SQUARE, ALLOWING FOR MATCHING AND 8% FOR WASTE IN CUTTING UP.

Common 8 and 10-inch sheathing.....	110 ft.
Common 12-inch sheathing.....	108 ft.
Shiplap, 8-inch.....	125 ft.
Shiplap, 10-inch.....	121 ft.
Shiplap, 12-inch.....	118 ft.
Roof Sheathing, laid with 2-inch space....	100 ft.
Roof Sheathing, laid tight.....	110 ft.
Shingles, laid 4½ in. to the weather, plain roofs.....	900 shingles
Same on hip and valley roofs.....	1,000 shingles
Siding, ½x4-inch, beveled.....	132 feet
Siding ½x6-inch beveled.....	120 ft.
Siding, 6-inch drop.....	120 ft.
Siding, 8-inch O. G. lap.....	114 ft.
Siding, 8-inch bungalow.....	116 ft.
Siding, 12-inch stock boards.....	108 ft.
Battens, lineal feet per square.....	108 ft.
Flooring, 2 -inch face.....	150 ft.
Flooring, 2¼-inch face.....	140 ft.
Flooring, 3¼-inch face.....	125 ft.
Flooring, 5¼-inch face.....	118 ft.
Ceiling, 3¼-inch face.....	125 ft.
Flooring, 3¼-inch face for porches.....	130 ft.
Ceiling, 3¼-inch face for porches.....	130 ft.

Where siding is put on with mitered corners add 10c per lineal foot of mitered corner to the amount after figured by the square at the regular rate. Where there are a lot of short spaces say, two to six inches as between frames and corners, add 6c per lineal foot for all such spaces after you have figured it by the square. You must get more money for such work or

you will come out behind when the cost of the work is figured up.

Another method of figuring that will approximate the same results is to figure the framing lumber, except roofs, at \$10 per 1,000 feet, timber measure. Figure roof framing at \$12 per 1,000 feet. Complicated roofs and wood truss work at \$15 per 1,000 feet.

ESTIMATING BY SQUARES.

Since a square is 100 square feet it may appear to some that there is no difference between figuring by the square and by the 100 square feet of material. There is a difference in some of the items and the difference arises in this way. It is because it takes more than 100 square feet of material to make a finished square of work in the building. Hence, to figure by the 100 square feet from the bill requires a different rate than to figure from the square, taking the measurements from the plans or the buildings. Following is a list of items figured by the 100 feet, as from a bill of material, and by the finished square as measured up on the job. These figures will give approximately the same result.

ESTIMATING THE LABOR OF FRAMING BY THE SQUARE.

Outside walls of buildings, 2x4 studding, 16-inch centers.....	\$ .75
Partitions, 2x4 studding, 16-inch centers....	.85
Outside walls of buildings, 2x6 studding, 16-inch centers.....	1.00
Partitions, 2x6 studding, 16-inch centers....	1.10
Ceilings, 2x4, 16-inch centers.....	.65
Ceilings, 2x6, 16-inch centers.....	.90
Floors, 2x 8 joists, 16-inch centers.....	1.28
Floors, 2x10 joists, 16-inch centers.....	1.60
Floors, 2x12 joists, 16-inch centers.....	1.92
Floors, 2x14 joists, 16 inch centers.....	2.24
Floors, 2x16 joists, 16-inch centers.....	2.56
Floors, 3x12 joists, 16-inch centers.....	2.88
Floors, 3x14 joists, 16-inch centers.....	3.36
Floors, 2x12 joists, 12-inch centers.....	2.16
Floors, 2x14 joists, 12-inch centers.....	2.52
Floors, 3x12 joists, 12-inch centers.....	3.24
Floors, 3x14 joists, 12-inch centers.....	3.78
Roof, plain, 2x4 rafters 16-inch centers.....	.80
Roof, hip and valley, rafters 16-inch centers..	1.00
Roof, plain, 2x6 rafters 16-inch centers.....	1.00
Roof, hip and valley, rafters 16-inch centers..	1.20
Roof, plain, 2x4 rafters 20-inch centers.....	.70
Roof, plain, 2x6 rafters 20-inch centers.....	.90
Roof, plain, 2x6 rafters 24-inch centers.....	.80
Roof, hip and valley, 2x4 rafters 20-inch centers.....	.90
Roof, hip and valley, 2x6 rafters 20-inch centers.....	1.10
Roof, hip and valley, 2x6 rafters 24-inch centers.....	1.00



CARPENTER LABOR		
DIFFERENT KINDS OF WORK.		
	Rate per 100	Rate per Square
Laying rough floor, diagonal 8 and 10-inch sheathing .....	\$1.00	\$1.10
Laying rough floor, diagonal 12-inch sheathing .....	.95	1.05
Laying 8-inch shiplap diagonal.....	1.10	1.38
Laying 10-inch shiplap diagonal.....	1.05	1.27
Laying 12-inch shiplap diagonal.....	1.00	1.18
Sheathing, 8 and 10-inch, laid horizontal .....	.85	.92
Sheathing, 12-inch, laid horizontal..	.82	.88
Sheathing, 8-inch shiplap horizontal ..	.95	1.20
Sheathing, 10-inch shiplap horizontal ..	.90	1.10
Sheathing, 12-inch shiplap horizontal ..	.85	1.00

Roof sheathing laid 2-inch open space	1.00	1.00
Roof sheathing laid tight.....	1.10	1.18
Shingling on plain roofs, per 1,000..	1.50	1.35
Shingling on hip and valley roofs, per 1,000 .....	2.00	2.00
Shingling on outside walls, per 1,000.	3.00	2.70
Siding, 1/2x4-inch beveled .....	1.50	1.88
Siding, 1/2x6-inch beveled .....	1.10	1.32
Siding, 6-inch drop .....	1.10	1.32
Siding, 8-inch O. G. lap.....	.95	1.08
Siding, 8-inch bungalow .....	1.00	1.16
Siding, 12-inch stock boards.....	.85	.92
Flooring, 2 -inch face.....	2.10	2.90
Flooring, 2 1/4-inch face.....	2.00	2.80
Flooring, 3 1/4-inch face.....	1.50	1.85
Flooring, 5 1/4-inch face.....	1.30	1.54
Porch floors, 3 1/4-inch face.....	1.40	1.82
Porch ceilings, 3 1/4-inch face.....	1.40	1.82
Room ceiling, 3 1/4-inch face.....	1.60	1.98

# The Installation of Dumbwaiters

Robert M. Sypher, Pres. Chelsea Elevator Co.

WHEN you have entered into a contract to install a Hand Power Dumbwaiter you have agreed to install what practically amounts to a private railway.

The machine is the motive power; the ropes are for the transmission of energy; the car is the carriage, and a very important feature in this private railway is the tracks upon which the carriage or car is to run.



Figure 1. The Simplest Form of Guideruns, Commonly Called Wall Climbers or Creepers.

places in the tracks, and when the car runs too freely it will either run off the tracks or make a rattling noise.

These annoyances can be easily overcome if proper attention is given to the type of guideruns and guides that are to be used in the equipment, as the tracks or guideruns used in Dumbwaiter installations are of a somewhat different construction than those used in the ordinary railway.

The guideruns used in Hand Power Dumbwaiter installations are as a general rule made of hardwood; preferably of Georgia pine or maple and the guides of cast iron.

Several combinations of guideruns that have been found to be the most successful in operation are described and illustrated below.

In Figure 1 is shown the simplest form of guiderun. It is known as the wall climber or creeper.

This form of guiderun is usually made in lengths of from twelve to sixteen feet and of Georgia pine about three and one-half inches deep.

The inner groove of the guiderun acts as a track for the counterweight and the outer groove acts as a track for the car.

The two cast iron guides are bolted to top of car and two to the underside of car for guidance of the car on outer groove of guiderun. The counterweight is fitted with four guides to operate on the inner groove of guiderun.

It is, of course, essential that the tracks are true and that they are plumb and parallel when erected, for if this is not the case the car will run off the tracks or bind in the hatchway.

A common complaint with Hand Power Dumbwaiters is that the car either binds in the hatchway or runs too loosely. If the car binds in the hatchway much energy is lost in getting it over the tight or uneven

These creepers can of course be placed on either side or on the back of hatchway as may be desirable.

In Figure 2 is shown another form of guiderun. This is simply another type of wall climber or creeper.

These creepers are usually made in lengths of from twelve to sixteen feet and of material about one and three-quarters inches wide and one and one-quarter inches deep.

The grooves in this creeper perform the same functions as those shown in Figure 1. The guides on the car are of a different type; but the operation of the car guides and the counterweight guides is similar to that shown in the first figure.

When guide runs of the creeper type are used they should be backed by cross pieces of pine about seven-eighths inches by four

only practical when the loads to be carried are not heavy.

The counterweight box is similar to that shown in Figure 3. It can be erected on either side or back of hatchway as may be desirable. The face that is screwed on the front of counterweight box extends about one and one-quarter inches over the sides



Figure 3. This Type is Known as the Wide and Narrow Slide.

of the box and acts as a track for the car. The counterweight runs free inside of the box.

Many carpenters who have mill facilities will find it advantageous to make up a stock of these guideruns during spare time. Dumbwaiter manufacturers are mainly in-



Figure 2. Another Form of Wall Climbers or Creepers.

and one-half inches wide. These cross pieces should be erected about four feet on centres. These cross pieces are to the guideruns what railway ties are to railway tracks.

In Figure 3 is shown a very satisfactory form of guiderun. This type is known as the wide and narrow slide. The counterweight runs freely in an enclosed box about nine inches wide and two and one-half inches deep. The face of the counterweight box is of seven-eighths inch Georgia pine; there is a groove on this face which acts as a track for the car, on one side of the hatchway. On the other side of the hatchway is erected a similar grooved guiderun of seven-eighths inch Georgia pine about four and one-half inches wide. Working in these grooves is shown still another form of cast iron guide for the guidance of car.

In Figure 4 is shown a very simple way of guiding car and counterweight. This is

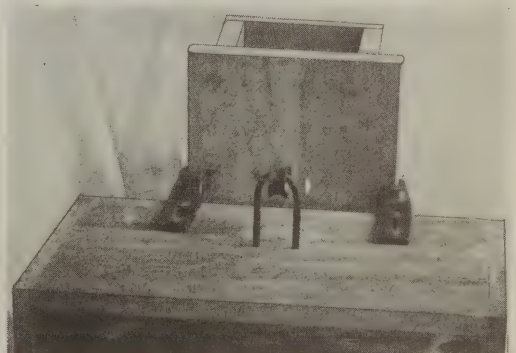


Figure 4. A Counter-weight Box and Guide for Light Loads.

terested in furnishing machines, counterweights, hardware, etc. The woodwork portion of a Dumbwaiter belongs principally to the carpenter trade. As this article is devoted principally to guides and guideruns, the matter of other woodwork portions will not be touched upon.



# Our Dictionary of Trade Terms

THERE is so much diversity in the names of materials, methods and processes of the building trades, in this country, that they often lead to confusion and misunderstanding, causing delay and loss, and much discomfort. Specifications sometimes are so written that the workmen are misled or seriously delayed, and trouble ensues. This series of explanations, terms, and phrases is designed to lessen this difficulty by an endeavor to establish a regular standard of names and terms, so that the workman in Maine, or Newfoundland will call a joist a joist, the same name as a workman will in El Paso, or Edmonton. This lack of uniformity in names has long been felt, and so far as the writer is aware there has never been any previous attempt to remedy the defect.

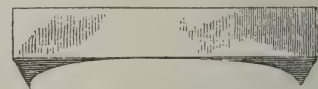
It is our intention to publish a couple of pages or more each month of these terms, in THE NATIONAL BUILDER. And if care is taken of them, they may be bound together in book form, and a valuable and useful volume will be the result. In the compilation of these explanations the writer will consult the standard authorities on the subjects set forth, and such additions as locality and time have made necessary, and this office will be glad to receive any suggestions, or corrections of errors, or omissions our readers may discover.

## A.

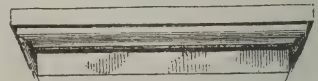
**ABACISCUS:** 1. Any flat member, moulding or fillet. 2. The square compartment of a Mosaic pavement.

**ABACUS:** In architecture. The final or uppermost member of a column in one of the orders of architecture, upon which in Classical architecture the Entablature (which see) rests, or in Gothic architecture from which the Arches (which see) spring. In Classical architecture, or which are called the five orders of architecture, the abacus is, in the Doric and Tuscan, a flat stone or tile, square in outline, with edges either plain or ornamented with mouldings. In the Ionic, Corinthian, and Composite Orders the abacus is square, but with each side hollowed out to a circular

curve, and the corners cut off or truncated. In Gothic architecture the major portion of the capital being made up of foliage or ornament, the abacus is the only part which admits of mouldings being displayed. The form or outline generally determines the Gothic style or date of the capital. In the Norman it is square or plain with the lower part chamfered (which see). In the Early English it is chiefly circular in plan—in the Decorated style it is either square, set diagonally, or circular, often octagonal. In the Perpendicular style the abacus is sometimes circular, but most frequently octagonal in plan. Eng. pron. *abbey-kuss* or *ah-bay-kuss*. Syn. Fr. *Abaque*, or *Tail-*



Grecian Doric Abacus.



Roman Doric Abacus.

*loir*—pron. *ah-baack*, *tah-ee-oh-ear* or *eer*—literally “a trencher” or “plate” and this from *tailler*—pron. *tah-ee-eh* to cut, carve, or dress; Ger. *Abacus* or *Capital-platte*, or *Platte einer Saule*—pron. *ah-back-us*, *kapp-ee-tal-plattay* or *platteh*, *platten* iner sow-lay.

**ABATTOIR:** A separate or detached building set apart for the slaughtering of animals designed to serve as butchers meat, with special conveniences and appliances. Eng. Pron. same as French; vulgarly various, as *ah-bat-ore* or *ah-batt-war*. Syn. Fr. *Abattoir*—pron. *ah-bah-twar* or *tuah*. Der. From the French verb *battre*, to strike or beat down, and this from the Latin *batuo*, I strike or beat down; Ger. *das Schlachthaus*—pron. *shlaght-house*—the *ch* or *gh* with the guttural sound (see Dissertation) *hau* pron. as between our word *house* and the Ger. *Haus*; from *schlachten*, to slaughter.

(To be continued)

# Mathematics and the Builder

*M. E. Davis, B. S.*

(Continued from March.)

**Theorem 5.** If two parallel lines are intersected by a third line the exterior angles on the same side of the transversal are supplementary. Likewise, the interior angles on the same side of the transversal are supplementary.

**Definition**—Supplementary angles are angles whose sum is equal to  $180^\circ$ .

Let  $AB$  and  $CD$ , in Figure 3, be two parallel lines intersected by a third line  $EF$ . To prove the angle  $EHB$  and the angle  $DGF$  are supplementary.

By inspection it is readily seen that the angles  $EHB$  and  $BHG$  are supplementary, since their sum equals  $180^\circ$ .

But by Theorem 3, the angle  $BHG$  equals the angle  $DGF$ . Therefore, we may substi-

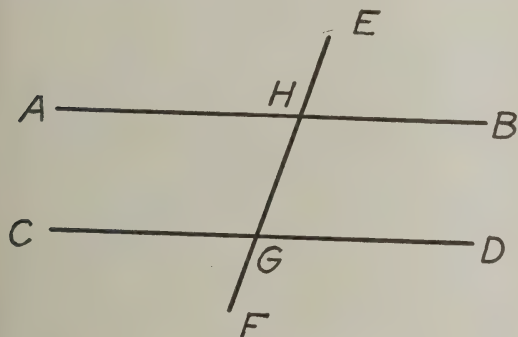


Figure 3.

tute the angle  $DGF$  for the angle  $BHG$ .

Then the angle  $EHB$  + the angle  $DGF$  equals  $180^\circ$ . Therefore, the angles  $EHB$  and  $DGF$  are supplementary.

In like manner we may prove that the angles  $BHG$  and  $HGD$  are supplementary.

**Theorem 6:** Lines perpendicular to the same line are parallel.

**Definition:** Two lines are said to be perpendicular when they form an angle of  $90^\circ$ .

Let  $AB$  and  $CD$  in Figure 4 be two straight lines, both perpendicular to the line  $EF$ . To prove  $AB$  and  $CD$  are parallel.

Since  $AB$  and  $CD$  both form angles of  $90^\circ$  with  $EF$ , the angle  $EAB$  equals the angle  $ACD$ . Now suppose the line  $AY$  to be drawn parallel to  $CD$ . Then by Theorem 3,

the angle  $EAY$  equals the angle  $ACD$ . Since things equal to the same thing are equal to each other, the angle  $EAY$  equals the angle  $EAB$ . Then the line  $AY$  must coincide with

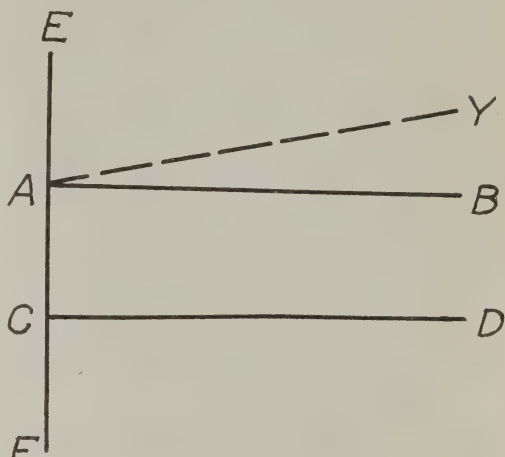


Figure 4.

the line  $AB$ . But  $AY$  was drawn parallel to  $CD$ . Therefore,  $AB$  is parallel to  $CD$ .

**Theorem 7:** In an isosceles triangle the base angles are equal.

**Definition:** An isosceles triangle is one in which two of the sides are equal.

Let the triangle  $ABC$ , Figure 5, be isos-

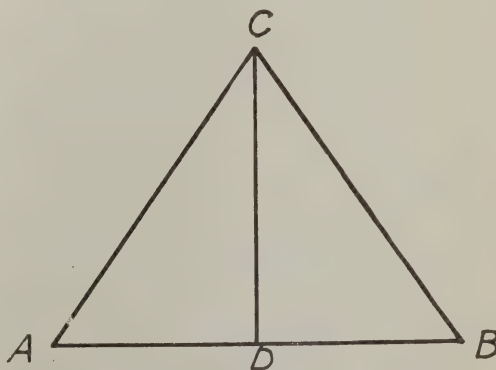


Figure 5.

celes. To prove the angle  $CAB$  equal to the angle  $CBA$ .

Draw the line  $CD$  to  $D$ , the middle point of  $AB$ . Revolve  $ACD$  about  $CD$  as an axis



until it falls on  $CDB$ . Since  $AD$  equals  $DB$ , the point  $A$  will fall on the point  $B$ . Then since  $C$  and  $D$  are points common to the sides of the angles, the angles  $CAD$  and  $CBD$  coincide. Therefore the angle  $CAB$  equals the angle  $CBA$ .

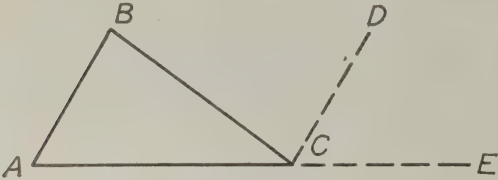


Figure 6.

**Theorem 8:** The sum of the angles of a triangle is equal to 180 degrees.

Let  $ABC$  in Figure 6 be any triangle. To prove the angle  $BAC$  plus angle  $ACB$  plus angle  $ABC$  equal to 180 degrees.

Extend the base  $AC$  to  $E$ . Draw  $CD$  parallel to  $AB$ .

Now the angle  $ACB$  plus the angle  $BCD$  plus the angle  $DCE$  equals 180 degrees, (1) by Theorem 3, the angle  $BAC$  equals the angle  $DCE$ , (2) by Theorem 2 the angle  $ABC$  equals the angle  $BCD$ .

In equation (1) we may substitute the angle  $BAC$  for the angle  $DCE$ , and the angle  $ABC$  for the angle  $BCD$ .

The perpendicular bisector of a line is a line perpendicular to the line at its middle point.

The angle subtended by a chord is the

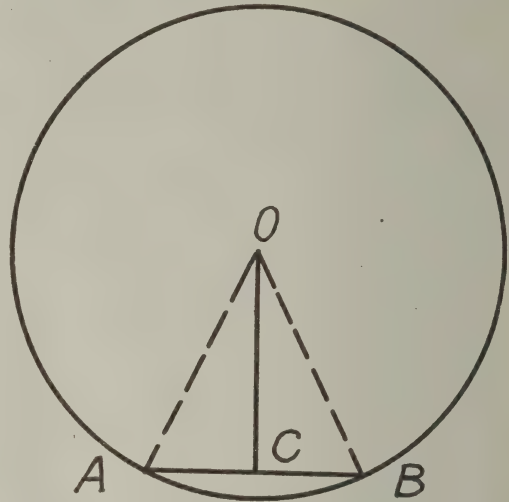


Figure 7.

angle formed by the radii to the points of intersection.

In Figure 7,  $AB$  is a chord of the circle whose center is  $O$  and  $OC$  is the per-

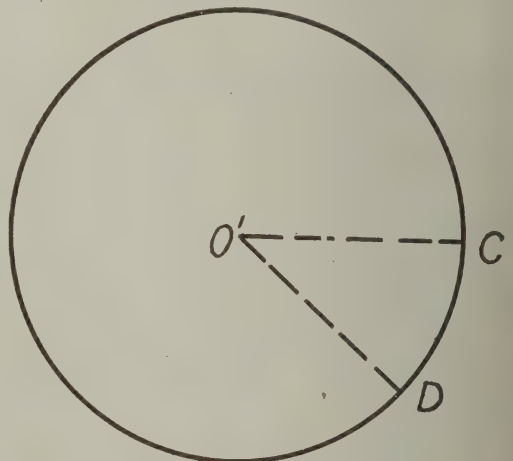
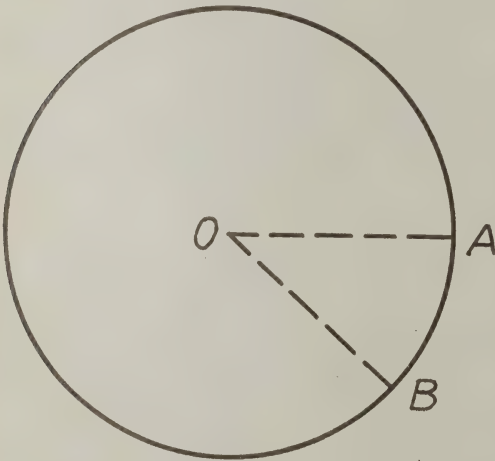


Figure 8.

Therefore the angle  $BAC$  and angle  $ACB$  and angle  $ABC$  equal 180 degrees.

**Theorem 9:** The perpendicular bisector of a chord bisects the angle subtended by the chord.

**Definitions:** A chord of a circle is a straight line which intersects the circumference in two points.

pendicular bisector. The angle  $AOB$  is the angle subtended by  $AB$ . To prove that  $OC$  bisects the angle  $AOB$ , or that the angle  $AOC$  equals the angle  $COB$ .

Since  $OC$  is perpendicular to  $AB$ , the angles  $ACO$  and  $BCO$  each equals  $90^\circ$ .

By Theorem 8 the angle  $AOC +$  the angle  $OAC + 90^\circ$  (angle  $ACO$ )  $= 180^\circ$  and the

angle  $\angle COB + \angle OBC + 90^\circ$  (angle  $\angle BCO$ )  $= 180^\circ$ .

Now all radii of circles are equal, hence the triangle  $\triangle AOB$  is isosceles, and the angle  $\angle OAB$  the angle  $\angle ABO$ .

By Axiom 1, angle  $\angle AOC + \angle OAC + 90^\circ = \angle COB + \angle OBC + 90^\circ$ .

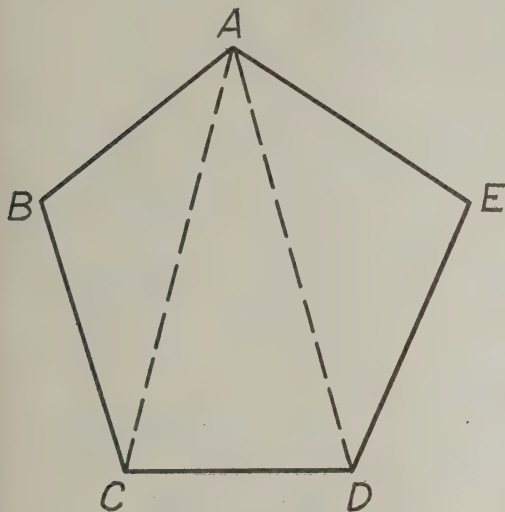


Figure 9.

Subtract the known equals from both sides and we have the angle  $\angle AOC = \angle COB$ .

**Theorem 10:** Radii intersecting equal arcs on the circumferences of equal circles form equal angles. Let the circle whose center is  $O$  equal the circle whose center is  $O'$ , and the arc  $AB$  equal the arc  $CD$ . To prove the angle  $\angle AOB$  equal to the angle  $\angle C'O'D$ .

Place the circle  $O'$  upon circle  $O$  so that the center  $O'$  falls upon center  $O$  and  $OD$  along  $OB$ . Now  $CD$  and  $AB$  are equal, therefore  $C$  will fall upon  $A$ . Hence the line  $OC$  coincides with the line  $OA$ , and the angle  $\angle COD$  coincides with the angle  $\angle AOB$  and are therefore equal.

**Theorem 11:** The interior angles of any polygon equals  $(n-2) 180^\circ$ , when  $n$  equals the number of sides.

In Figure 9, let  $ABCDE$  be any polygon. To prove the sum of the interior angles  $= (n-2) 180^\circ$ .

From any vertex  $A$  draw lines dividing the polygon into triangles. The sum of the angles of the triangles will equal the sum of the angles of the polygon. We can only draw  $n-3$  diagonals, which form  $n-2$  triangles. The sum of all the angles of all the triangles equals  $(n-2) 180^\circ$ . Therefore the sum of the interior angles equals  $(n-2) 180^\circ$ .

**Theorem 12:** The sum of the exterior angles of any polygon equals 360 degrees.

**Definition:** The exterior angles of a polygon are the angles formed by projecting one end of each side, as shown in Figure 10.

Let  $A$  be any polygon and  $B, C, D, E$  and  $F$  its exterior angles. To prove the sum of the angles  $B, C, D, E$  and  $F$  equals  $360^\circ$ .

Each exterior angle equals  $180^\circ$  — the corresponding interior angle. By theorem 11, the interior angles  $= (n-2) 180^\circ$ ,  $n$  exterior angles will equal  $n (180^\circ - (n-2) 180^\circ) = 180^\circ n - 180^\circ n + 360^\circ = 360^\circ$ .

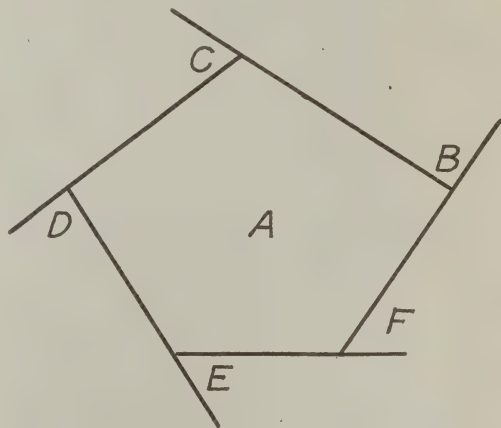


Figure 10.

Therefore the sum of the angles  $B, C, D, E$  and  $F$  equals  $360^\circ$ .

The foregoing theorems, while they do not comprise the whole of geometry by any means, contain enough information to enable the student to readily understand geometrical problems of construction. To the practical man these problems are the most useful part of the subject and they will be taken up in the later article.



# Porch or Garden Furniture

*Jno. S. Edmund*

WITH the interest that is being shown in garden or out-door life in both the country and city there is a natural demand for useful and decorative

ing especially attractive in our simpler homes where it harmonizes so finely with the surroundings. The placing or location of the furniture either in the garden or on the porch has a great deal to do with the

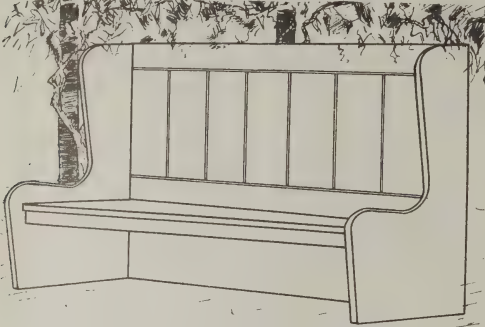


Figure 1.

out-door furniture. The style of furniture that is distinctive on account of its sim-

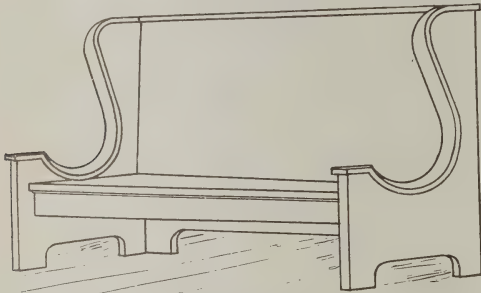


Figure 2.

plicity in design is at present the most called for. This design of furniture is prov-

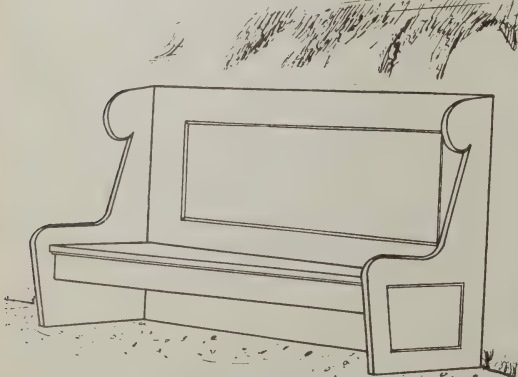


Figure 3.

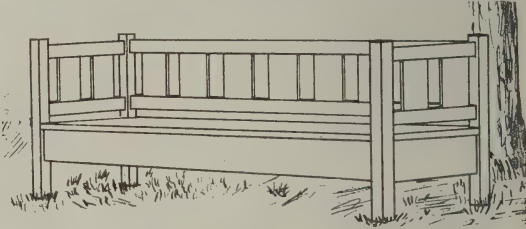


Figure 4.

attractiveness and beauty of our out-door surroundings.

There is always refreshment and strength on a hot day in the very sight of a seat on a cool embowered porch or under the

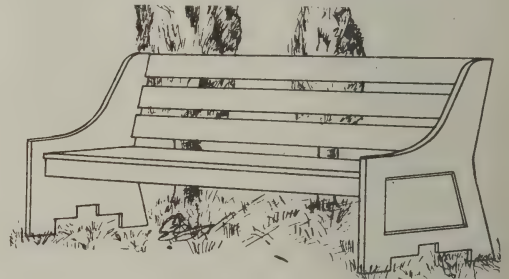


Figure 5.

spreading branches of a large tree. Seats placed in the proper locations help to give the surroundings a home-like appearance.

The illustrations given here are porch or garden seats made attractive by their simplicity, durability, comfort and real beauty.

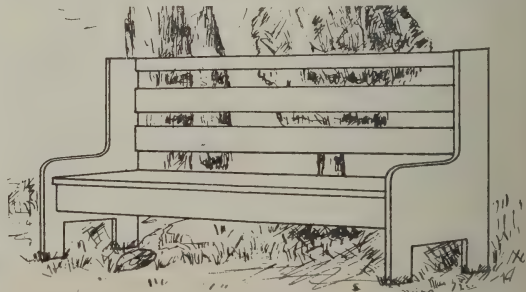


Figure 6.

The most suitable woods for seats of this style are well selected white pine and cypress timber. These seats are more massive than the ordinary porch settees and more strongly constructed.

All joints are mortised and tenoned and thoroughly coated with white lead before being put together. Before being painted three or four coats of white lead the lower ends of the posts should be allowed to stand in creosote or tar.

They are to be built so that the water will easily drain off. Holes should be made in the seats to aid in the draining.

Figures 1, 2 and 3 are high backed seats. The seat part should be made of selected wood from  $1\frac{1}{8}$ " to  $1\frac{3}{4}$ " in thickness with a number of holes for draining as before mentioned. The ends may be of the same thickness as the seat or a size heavier. The backs should be constructed of  $\frac{7}{8}$ " or 1"

material. The tenons should be long or if possible go through post and secured with dowels.

Figures 4, 5 and 6 are seats with lower backs than the first three. These should be constructed on the same principle as the others although they may be made of lighter material if desired.

The total length of these seats may be from 3' 6" to about 5' 6" and the width from 14" to 20".

The seats may be built in place on the porch and become a fixed piece of furniture or if in the garden can have pointed pickets or stakes secured to the ends and driven deeply in the ground for making them stationary.

The importance of porch or garden seats cannot be over estimated as everywhere the desire prevails to be out in the open as much as possible.

# Engineering For the Contractor

## Tenth Article—Continued from March

### PLANE SURVEYING.

**N**OW while we found the area of the plot shown in Figure 13, as close as we could scale our drawing, we can also find it by the other method. You will remember the rule that the area of any triangle equals the square root of one-half the sum of the three sides multiplied by the difference between the half sum and each of the three sides.

In other words the area of the triangle A B G equals the square root of  $169.4 \times 59.4 \times 81.4 \times 28.6$ , the three sides being 110, 88 and 140.8 respectively, their half sum being 169.4.

By carrying out this operation we find the area of the triangle A B G equals 4,840 square feet, exactly the same as we found by the other method. The other triangles may be found in the same manner and the results should check very closely with the figures obtained by measuring the altitudes. It must be remembered that it is difficult to *scale* a drawing accurately. For instance, in Figure 13, about three sixty-fourths of an inch, less than one-sixteenth, equal one *foot*, so it is manifestly impossible to get *exact* results unless you draw the plot out at a large scale.

Those of you who are familiar with deeds remember the phrase "be the same more or less," and you probably now realize how much a little off measurement may make a number of feet difference. Just for example, if our measurement of the line A G should be 89 feet in place of 88 feet, it would make a difference of 55 square feet, a total error in the whole plot of about one-half of one per cent or one two hundred and seventeenth of the whole.

Similar errors might increase the total error, while a measurement too small, which is more likely to happen, would decrease the error. Do not depend upon these errors to equalize each other, however, but get every measurement as exact as possible. Keep the tape always in line, with the instrument, between the two points, and keep it level, even if you have to take short readings and use a plumb-bob. Don't try to pull the tape too tight, you may break it. A slight sag in the line, even if 100 feet, will not make more than a fraction of an inch difference. It is a good plan when using a 100-foot tape to have a man hold the center up level with the ends. Just for fun, try the tape on a level sidewalk and then raising the ends a foot, with the center just touching the walk, see how



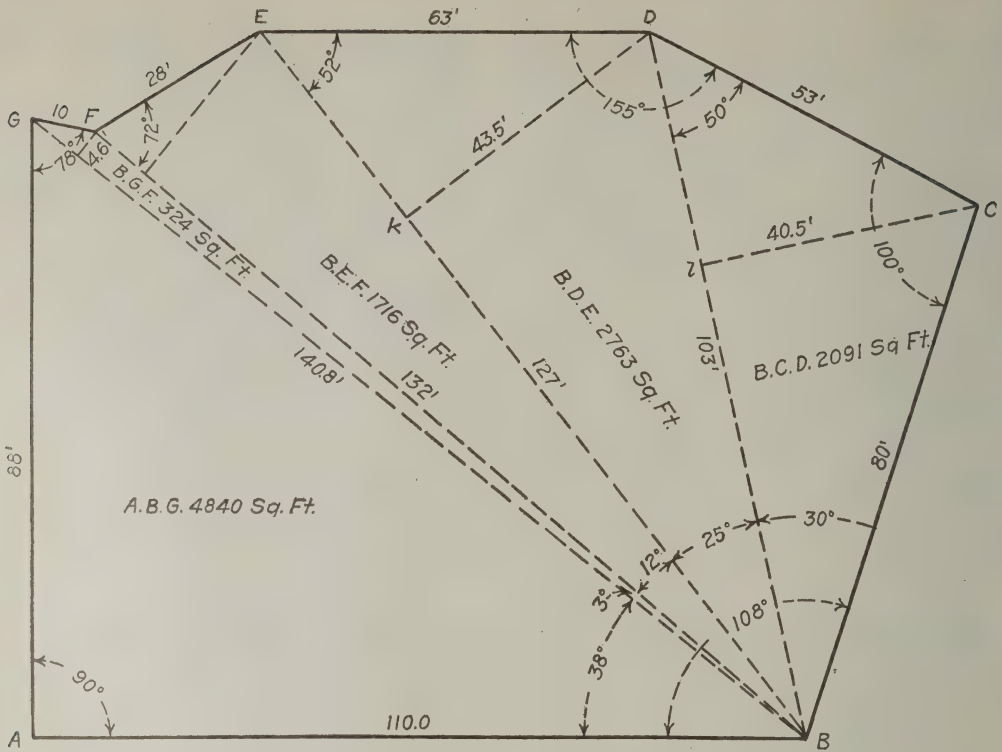


Figure 13.

much short you are. It will be a good guide for you. Then stretch the tape as

we made up the figure of triangles from any other point, as Figures 14 and 15.

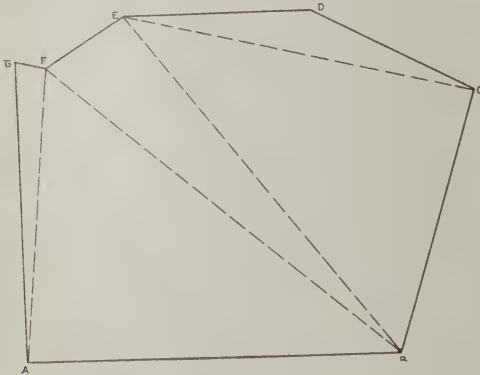


Figure 14.

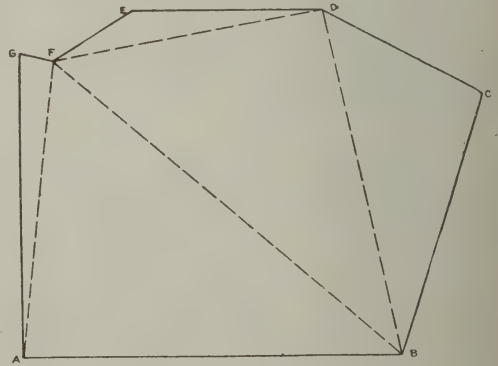


Figure 15.

tight as you do in ordinary work and compare the results.

It would not make a bit of difference if

The lengths of the inside lines would be somewhat different, but the triangles will total up exactly the same.

# The One Man Shop

Charles Cloukey

## Second Article

THE extended use of the one machine set forth in the preceding article, together with such attachments and devices as the workman will be able to apply, will equip him for an astonishing variety of operations.

But we must not expect a man of no experience with machines to think of the many ways of using them all at once. And this is the reason that the experience and observations of a man of long and varied experience may be of value to the user of the one machine for many things.

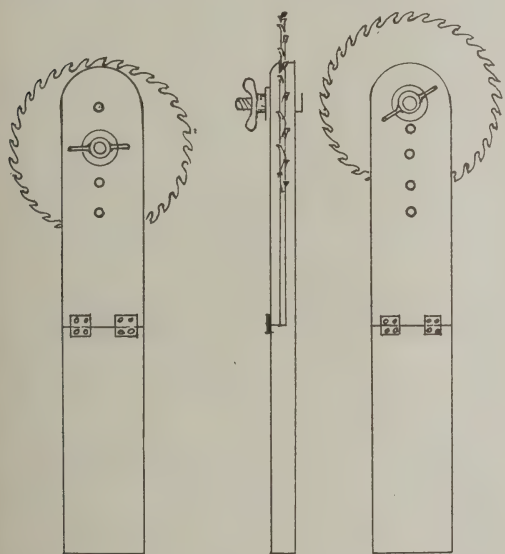


Figure 1. A Saw Clamp for Filing Circular Saws.

First in regard to the care of his saws, he should buy a hand set and spring set both his rip and cut-off saws. The proper width for general ripping is about  $\frac{1}{8}$ -inch and for cutting off the general run of shop work would require about 3-16 set or a little less.

A good way to handle circular saws in the shop while setting and filing them is to have a clamp made like Figure 1, which can be held in any bench vise or if the light is poor there it may be held to a bench or plank by means of a hand-screw.

When setting the saw the teeth should

project far enough from the clamp so as not to bother about handling the set; but before filing the saw should be lowered to another hole in the clamp which leave only the length of the tooth out of the clamp.

When filing rip-saws you will get a cleaner cut with less expense of power by filing straight across under the point and file with a slight bevel on the top of the tooth. This gives somewhat of a point to the cutting edge of the tooth and in consequence you have a shear cut which costs less power than the straight chisel point. However, be careful not to let the inner corners of the teeth get longer than the outer ones.

In filing the cut-off saws, just the reverse is followed if the teeth are large, say half an inch or more front point to point. The bevel edge is put in front of the point and



Figure 2. A Handy Device for Holding Lumber.

the straight back gives more strength to the tooth itself. In saws of smaller teeth it is best to file as one would for a hand-saw.

If a "smooth cutting saw" is used great care should be taken to preserve the shape of the teeth and especially the bevel of the front of the teeth and the slant of the top part of the back.

And while speaking of the shape of teeth, I would impress it upon the mind of the shop man that when he buys a new saw, he should lay it down on a piece of paper or board that he can be sure to save, and with a sharp pencil carefully mark around the teeth so that as long as he uses the saw he can dress the teeth to the same shape. It is a fact that a man will soon forget the true shape of the teeth and before long his saws will be a sight to look at as well as doing poor and expensive work.

And just before I forget it, I want to say that no shop man handling saws can



afford to be without a guard for his machine. There are several makes on the market, and he should select one that can readily be removed for the performance of other work. But do not try to work about the saw or running cutter heads of any kind without a guard wherever possible. You will be tempted to lay them aside when they bother, or leave them off on account of hurry, but it will take much longer to get those fingers or that hand back after being flung into the sawdust.

I once knew a man who had a few machines in his shop, and for one of them at least, he had never provided a shifter for the belt, but would shift the belt onto the pulley with his foot. When I saw him he was limping around with a crutch, just recovering from a broken leg. He told me that he had shifted the belt that way for more than two years without a mishap until the time his foot was caught in such a manner as to break his leg.

The one other thing a man can do to keep from accidents besides using all the guards possible is to keep his attention concentrated on his work while he is engaged in an operation. Let no noise or excitement at hand cause him to take his eye off of his work if there is any danger of its getting away from him.

If the board pinches the saw one can generally raise it straight up with his hands, leaving the farther end rest on the table, but he must use judgment about letting it down on the saw again, for if the piece is light it is apt to be caught by the saw and thrown toward the sawyer unless he holds it very firmly. Sometimes we can rip about half way through a board when it will pinch the saw, and we can take it off and turn it around and rip from the other end and so make out to finish it.

It is a good rule to so adjust the table or saw that the teeth will come only about a quarter of an inch above the top of the board. This is especially pertinent when a guard is used, as it gives all the movement possible to the guard itself.

When using the rip-saw for narrow stock it is necessary to have a stick at hand for the purpose of pushing the ripped piece past the saw, thus relieving the hand of the danger of working very close to the teeth. Fig. 2 shows a convenient form of this stick, and it should always be within

reach, for sometimes the sawyer will forget it until he gets ready to use it and then he will not be able to let go and hunt it up.

But to return to the care of the saw for a moment more, we find that however expert the filer may be, he will not be able to keep his saws round without an occasional jointing. The simple way to joint a circular saw is to let the saw down until the tips of the teeth barely protrude above the table, and then start it going and take a piece of grindstone, emery wheel or file and rub over the place until the teeth have all been touched. The long ones will then be reduced to the length of the short ones. Now is the time to look out for the proper shape of the teeth.

When a saw gets hot in the cut and begins to run crooked, the board should be taken out and the saw kept running until it cools, or it may very likely shrink out of shape permanently.

The same general principles that govern in the care of saws will apply to the use of the dado head, and that is to keep the shapes and bevels the same as new. Have the cutting edges sharp and you will save gasoline or current, as the case may be. There is no time so expensive as that which is not spent in sharpening saws and cutter knives—when they need it!

Perhaps we may touch upon some of the things which may be done with the circular saw and which may not occur at once to all of those who would use this versatile machine for all it is worth.

Touching again upon the use of the smooth-cutting rip-saw, I may mention the fact that with lumber from the lumber yards already surfaced both sides, one may rip parting and blind stop with a finished surface so that it will not need planing at all. This is an item of real importance to the small shop which intends to cater to the yard trade.

If one has two rip-saw blades and has a lot of small ripping to do, he can slip a wooden collar in between the two saws and so rip two pieces at once if he has enough power. Of course, he will have to make a new throat or else cut another slot in the one he already has. The cuts in the wooden throats are made by fitting the throat in place and then letting it down on the saw or cutter head until the proper amount of wood is cut away. Make a good

assortment of these throats. If you have a new use for one do not spoil an old one, but fit up a new one, as it takes but very little more time, and then the next time you need either one of them there will they be.

And while we are on the subject of throats, permit me to say that it is very dangerous to try and rip very narrow stuff over a badly worn or wide throat. If you need to do this kind of work and do not wish to make a new throat, or put on another one, the danger may be sidestepped by raising the table and clamping on a thin piece of board over the working space desired to be used, and then let it down over the saw, which will cut through only as far as the space occupied by itself, and leave no room for the thin piece to be jerked down as it is ripped off.

Another of the legitimate uses of the rip-saw is that of grooving, and it is needless to say that grooves of every size from the width of the saw thickness up, and as deep as the saw will reach can be made on the common rip-saw if enough care and time is devoted to it. But a shop of this kind should have a half-inch grooving saw, or what would be better, an adjustable dado

head which can be used for grooving and cutting also. There are several good makes on the market at reasonable prices.

When it comes to variety work, the cut-off saw is quite as important, if not more so, than the rip-saw. With the cut-off gages adjustable to 45 degrees either way and the table tilting to an angle of the same degree, one can imagine a fertile field for the development of ideas.

The cutting of bridging for contractors and builders is an item of considerable importance, and it may be done in one of two ways. The table may be tilted and the stock cut off the flat way, or the miter gage may be used and the stock cut off sidewise, which is the handiest way in case the saw will reach through the pieces when they are held up on edge. In this latter operation the lumber is held in a horizontal position, while in the former it must be tilted up at the same angle as the table of the machine.

The making of panel work by the use of this machine will be discussed next, but as it will require quite a little space, I will leave it for another paper, as well as several other operations of equal interest and importance.

## Some Notes on the Steel Square

Figure 30 exhibits the plan of an obtuse angle.

To find the angles to cut the sides and miter the edges when the run of the sides

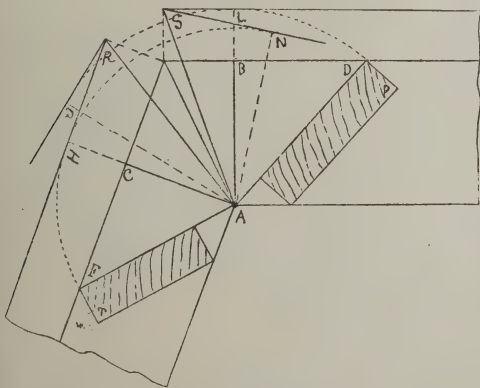


Figure 30.

and the angles of elevation are unequal.

Square up from A to B, and from C to F equal the rise of the sides; join A D and

Square up from A to B, and C, equal the runs of the sides. Set up from B to D, and from C to F equal the rise of the sides; join A D and A F; then A D B and A F C equal the angles of elevation, A D and A F the widths of the sides.

To find the angles to cut the sides: From the point A as center, describe arcs from the points F and D: tangent to the arcs, draw lines parallel to D B and F C, cutting the dotted lines squared up at R and S; join A R and A S; extend A B and A C to H and L. Then  $\angle R H A$  equals the angle to cut the side A F, and  $\angle S L A$  equals the angle to cut the side A D.

To find the angles to cut the edges: Draw the tangent J R at right angles to A J, and the tangent N S at right angles to A N. Then  $\angle R J A$  equals the angle to cut the edge F T, and  $\angle S N A$  equals the angle to cut the edge D P.

By the use of the square: Place the square on the side A F, with H A on the blade,



and  $HR$  on the tongue; mark from the latter. Place the square on the edge  $RT$ , with  $JA$  on the blade, and  $JR$  on the tongue; mark from the latter for the cut required.

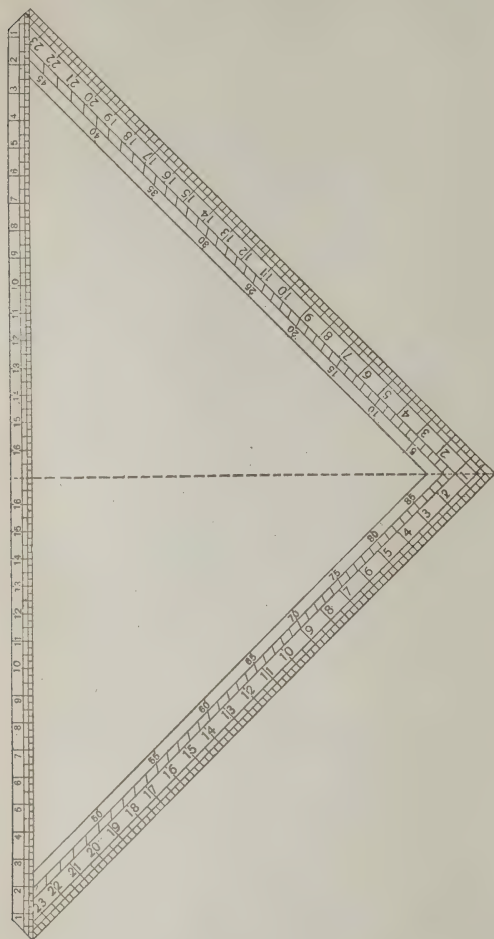


Figure 31.

Place the square on the side  $AD$ , with  $LA$  on the blade and  $LS$  on the tongue; mark from the latter. Place the square on the edge, with  $NA$  on the blade, and  $NS$  on the tongue; mark from the latter for the cut required.

Figure 31 exhibits the square and protractor, the tongue of the square extended to equal the length of the blade and the vertices of the square joined by the diagonal, which is divided into inches and subdivided the same as the square. The internal margin of the square exhibits the protractor for finding the elevation of rafters, when specified in degrees; for finding the content of surveys, the distance to,

and between inaccessible objects; and also, with the spirit level attached, the angle of elevation and depression, which makes a valuable and convenient instrument for finding the length of the diagonal of a rectangle or equilateral square, and also for finding the lengths and cuts for rafters to any degree of elevation.

To find the degree of elevation of an object: Place the side of the instrument at right angles to the horizon; place the rod on the line of degrees, at the intersection of the diagonal; take the observation for the angle required. If the angle of elevation is greater than  $45^\circ$  place the rod on the opposite point of intersection. The angle of depression is found by reversing the operation.

1. To find the angle to cut rafters for  $\frac{1}{4}$  pitch: Place the rod on the points 24

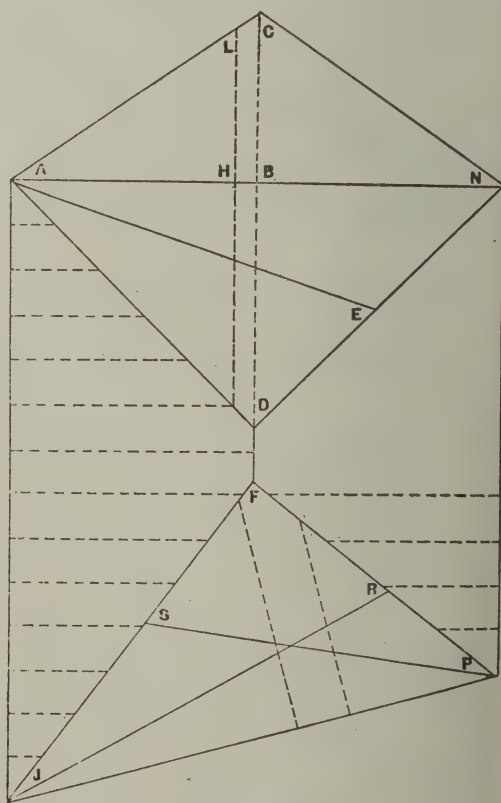


Figure 32.

in. and 12 in.; mark from the square for the cuts required.

2. To find the angles to cut rafters for  $\frac{1}{3}$  pitch: Place the rod on the points 24

in. and 16 in.; mark from the square for the cuts required.

3. To find the angles to cut rafters for  $\frac{1}{2}$  pitch: Place the diagonal of the square and protractor on the rod; mark from the square for the cuts required.

4. To find the length of common rafter for  $\frac{1}{4}$  pitch, on 25 ft. span =  $12\frac{1}{2}$  ft. run, and 6 ft. 3 in. rise.  $12\text{ ft. }6\text{ in.} = 150\text{ in.} \div 8 = 18\frac{3}{4}$  inches.  $6\text{ ft. }3\text{ in.} = 75\text{ in.} \div 8 = 9\frac{3}{8}$  inches. Place the rod on the points  $18\frac{3}{4}$  and  $9\frac{3}{8}$  in.; mark from the points for one-eighth the length, and from the square for the cuts required.

5. To find the length of common rafter for  $\frac{1}{3}$  pitch on 25 ft. span =  $12\frac{1}{2}$  ft. run, and 8 ft. 4 in. rise.  $12\text{ ft. }6\text{ in.} = 150\text{ in.} \div 8 = 18\frac{3}{4}$  inches.  $8\text{ ft. }4\text{ in.} = 100\text{ in.} \div 8 = 12\frac{1}{2}$  in. Place the rod on the square; mark from the points  $18\frac{3}{4}$  in. and  $12\frac{1}{2}$  in. for one-eighth the length, and from the square for the cuts required.

6. To find the length of common rafter for  $\frac{1}{2}$  pitch on 25 ft. span =  $12\frac{1}{2}$  ft. run and  $12\frac{1}{2}$  ft. rise.  $12\text{ ft. }6\text{ in.} = 150\text{ in.} \div 8 = 18\frac{3}{4}$  inches. Place the rod on the square; mark from the points  $18\frac{3}{4}$  in. and  $18\frac{3}{4}$  in. on the square for one-eighth the length, and from the square for the cuts required.

7. To find the length and cuts of common rafters for any degree of elevation, by the use of the square and protractor. Reduce the run to inches; divide the product by the smallest divisor that will bring the quotient within the limits of the square. For example:  $20\text{ ft. span} \div 2 = 10\text{ ft. run,} = 120\text{ in.} \div 6 = 20\text{ inches,} = \frac{1}{6}$  the run. Place the rod on the line of degrees 20 inches from the internal angle of the square, and the 25th degree of elevation; mark from the points for  $\frac{1}{6}$  the length, and from the square for the cuts required.

Figure 32 exhibits a practical demonstration of finding the lengths of common, hip and jack rafters, for right, obtuse, and acute angled buildings, on a 22 ft. span. To reduce 22 ft. span to a scale within the limits of the instrument.  $22\text{ ft.} \div 2 = 11\text{ ft. run, } 11\text{ ft.} = 132\text{ in.,} \div 6 = 22\text{ in.,} = \frac{1}{6}$  the run of the common rafter, and A C

equals  $\frac{1}{6}$  the length of the common rafter. Set off from D to E, from F to R, and from F to S, equal to the rise B C; join A E for  $\frac{1}{6}$  the length of the hip rafter for the right angle, and from P to S for  $\frac{1}{6}$  the length of the hip rafter for the obtuse angle, and J R for  $\frac{1}{6}$  the length of the hip rafter for the acute angle.

To find the lengths of the jack rafters: Divide A L into as many parts as there are jacks; then each part equals  $\frac{1}{6}$  the length required.

The above operation will be found useful to builders in finding the exact lengths of all timbers required for plain and hip roofs, braces, etc., and in estimating on the actual cost of materials.

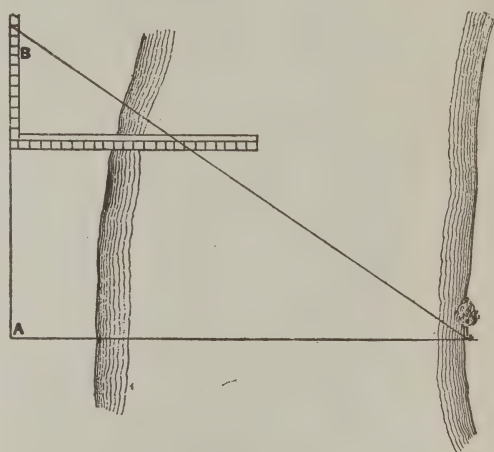


Figure 33.

Figure 33. Wishing to know the width of a stream of water, I measured 5 feet from the side of the stream where I placed the square and protractor in range of an object on the opposite side of the stream, and measured 30 feet at right angles to the line, in range of the object, to the point B, where I placed the square and protractor, and found by observation that 12 in. on the line from the station to B, gave  $17\frac{1}{2}$  inches on the line from the station A to the object.  $30 \times 17\frac{1}{2}\text{ in.} = 52.5\text{ ft.,} - 5\text{ ft.,} = 47.5\text{ ft.,}$  the width of the stream.

(To be continued.)

Recovery by an architect for services rendered in connection with the construction of a building cannot be defeated because the owner negligently paid the contractor the full amount, retaining no

reserve fund to enable him to compel the contractor to complete the construction, and to rectify minor defects, despite insolvency.—Johnson v. O'Neill, 148 N. W. (Mich.) 364.



# Metal Lath Construction

*W. Geo. Lane, Bostwick Steel Lath Co.*

**M**ETAL LATH has been used for upwards of twenty years, and the manufacturers have met every objection to its use by furnishing the contractor a material permanent, dependable and economical. Architects and engineers have found uses for Metal Lath not dreamed of by the makers, and the uses are daily increasing. Some of the leading uses are shown on the supplement for this month, although there are many variations possible. The contractor should study these details as they represent the best practice of the leading architects and engineers throughout the country.

## VERTICAL OPENINGS

In buildings containing any material fire hazard, the enclosures around vertical openings are second only in importance to fire walls. The latter prevent horizontal communication of fire; the former prevent the vertical spread. This refers to beltways, open light shafts, air vents, and dumb-waiter shafts, and is distinctly applicable to stair and elevator shafts. Hence stair enclosures and other vertical openings of that sort in such buildings should be made of a construction which will adequately resist the severest possible fire and water test to which the structure may be subjected, and their construction should possess stability and should to a high degree have the quality of yielding sufficiently, without failure, to stresses caused by heat to take up the contraction and expansion. These movements might otherwise cause entire failure, the co-efficient of expansion in some materials being very high and ductility low, while adequate means for anchorage into the base members do not exist.

From the standpoint of fire resistance, unprotected stairways and elevators are wholly wrong and entirely inconsistent with other features of design which are provided with great care. Thus, for instance, we insist upon fire-resisting floor construction, not only to carry the superimposed loads safely (for ordinary construction would not do that) but to provide a floor system which will prevent the communication of fire from

story to story and which will, under fire test, require a minimum of repair. And then, having done so, we promptly render all this expense of no avail by introducing passages of vertical communication, inviting wreck and ruin from fire and water, and danger of panic from flame and smoke. Indeed, the entire Baltimore conflagration was undoubtedly attributal to this common but deplorable practice, as is indicated by the following comment from an eminent authority:

"The Baltimore conflagration is directly chargeable to unprotected floor openings. Had the stair and elevator-openings in the building where the fire originated been properly protected, there is every reason to believe that the fire department would have been able to control the fire at the start."

The importance of properly fire-proofing a column or structural member increases in proportion to the service rendered—that is, the load carried—and also in proportion to the exposure to fire reasonably to be expected. The basement and lower story columns should be given more efficient protections than light upper-story columns, and buildings or portions of buildings where combustible contents are liable to exist in quantity particularly demand better column protection than would naturally be provided in buildings containing less hazard.

Experience shows that these points are very often overlooked. The steel frame is carefully designed for the required dead and live loads, and the individual members are accurately proportioned for recognized fiber strains computed by accepted formulas; but from this point on the proper fire-proofing of isolated columns, which frequently demand architectural treatment, or a minimizing of floor space, often resolves itself into a question of "how little," rather than "how good." It is not uncommon to find that, after deducting three-quarters of an inch on all sides for plaster, even less than two inches remain around important columns in which space the contractor for fire-proofing is expected to place efficient protection.

Around columns, a double layer of Metal Lath and cement plaster, next to concrete and brick, develop the best fire resistance. In all cases where the double thickness is provided the inner layer is unaffected by the severest abuse of heat and water, and



Figure 13. The Method of Over-coating Frame Buildings With Metal Lath and Plaster.

the structural members are satisfactorily protected. This is shown in Figure 7.

Where only one layer of Metal Lath and plaster is employed and it is supported by well-erected steel furring and anchored to the columns, it fulfills the requirements under normal conditions that prevail in offices, hotels and similar buildings. The use of

the double layer of Metal Lath and cement plaster, well anchored is recommended for the more severe requirements. It is just an additional factor of safety where the presence of a large quantity of inflammable material might make possible a fire of intense heat and long duration. Figure 9 shows this form of protection, with provision for a wide air space. As a substitute for the double layer of Metal Lath and plaster, it is considered good practice to fill the space back of the single layer of Lath and plaster and around the column with a lean mixture of concrete. Freitag's Fire Protection suggests this latter method as in Figure 5.

#### BEAM PROTECTION

Steel Girders may be inexpensively protected against fire, as shown in Figures 7 and 13.

Where unusual hazards exist, a form of protection involving the use of a double layer of Metal Lath and cement plaster, providing an air space is suggested as extremely efficient, light and inexpensive.

#### GASOLINE OR ACETYLENE GENERATOR AND STORAGE HOUSE

This generator and material storage house, shown in Figure 10, will meet a long felt want.

The ordinary generating chamber built into the ground is damp and hard to clean, and does not supply storage capacity for the illuminating material.

The Metal Lath and plaster generator house is easily accessible, fireproof and allows the service pipe to be taken into the house above windows height, an appreciable saving in installation cost.

Dig trench for tile foundation 10' x 10' the required depth to get below the frost line, tile to come 4" above ground. Use 2x4s for sills and joists, joists 8' high spacing 24" on centers—use 4x4s for corner posts frame at top with 2x4s, make quarter pitch roof of 2x4s spread 24" on centers, run partition 8' high of 2x4s, 24" on centers, the length of the building and provide with 2 doors swinging outwards—cover the inside of doors with metal roofing or other sheet metal, smooth natural floor and cover with 3" of ordinary concrete with 1" finishing coat.



Roof with sheet metal or other non-combustible material, in one compartment build shelves of channel iron, or other fireproof material that may be at hand, the required height for the generator, flooring the shelf with heavy sheet metal; in other compartment raise concrete on one side to sufficient height for a convenient shelf for gasoline cans and shelves as described for other inflammable material—lay Metal Lath inside and out on the joists nailing every 4" with 4-penny nails, use 8-lb. Lath for exterior and 5-lb. for interior, plaster exterior with  $1\frac{1}{2}$ " ground according to regular specifications and inside with  $\frac{3}{4}$ " ground, plaster partition both sides with  $\frac{3}{4}$ " ground—run strip of Lath along top of partition and plaster.

#### AN INEXPENSIVE FIREPROOF SMOKE HOUSE

Prepare building of suitable size for your requirements, using 2x4 joist and studding, lay Metal Lath on each side of studding and under side of the Roof, nail every 4" with four-penny nails. Plaster with  $\frac{3}{4}$ " ground inside and  $1\frac{1}{2}$ " ground outside, according to regular plastering specifications—either line your door with Metal Lath and plaster, or cover with sheet metal. Roof with sheet metal or other non-combustible material.

With this construction, shown in Figure 18, you have absolutely no danger of a fire that would in all probability spread to your farm buildings.

#### RAT PROOF, BIRD PROOF, THIEF PROOF CORNCRIB

The Cornerib shown in Figure 24 is built in the ordinary manner of a size to suit your requirements, placing joists 16" on centers, laying Metal Lath horizontally on inside of joists, with loops taking the inside of the crib, nailing every 4" on each joist with four-penny nails. Lay Metal Lath crosswise on the floor, turning up when it joins the wall to overlap the wall lath 4". Painted as you would paint a metal roof, this cornerib will last indefinitely, and save its cost every year, in the amount of grain saved from destruction.

#### METAL LATH AND PLASTER, FIREPROOF FACTORY OIL HOUSE

Dig trench 10' x 16' of sufficient depth to get below the frost line for tile foundation, tile to extend 4" above the ground level.

Use 2x4s for sills, 4x4s for corner posts and 2x4s for studs 8' high and spaced 24" on centers. Frame at top with 2x4s and make one-fourth pitch roof 2x4 rafters placed 24" on centers. Provide door swinging outward of sufficient size to allow entrance of large size barrel. Line the door with heavy sheet metal. Lay Metal Lath, 8 pounds per square yard for exterior and 5 pounds per square yard for interior vertically, on both sides of 2x4s, nailing to studs every 4" with 4-penny nails. Plaster according to regular specifications with  $1\frac{1}{2}$ " ground for outside and  $\frac{3}{4}$ " ground for inside. Cover roof with sheet metal or other non-combustible material, smooth natural floor and cover with 3" of rough concrete and 1" finishing coat. Along one side raise concrete 18" above floor level and 30' wide for barrel rack slightly hollowing in the center every 30" to prevent rolling. On other side build iron frame shelving to suit requirements, flooring the shelves with heavy sheet iron for other lubricants.

#### PROTECTION OF STEEL BEAMS IN SLOW BURN- ING OR MILL CONSTRUCTION

In machine shops and other plants requiring exceptionally heavy floor construction above the ground level, steel beams are of necessity resorted to, and with these wide spacings of from 7 to  $12\frac{1}{2}$  feet are maintained, thus retaining all the advantages of the standard mill construction except that of resistance to fire. Provision for this when necessary can be made by fireproofing as shown in Figure 12. In this type, to obtain unusual stiffness between the beams, the floors may be made up of 2-inch joists on edge spiked together closely side by side, the thickness of the floor varying with the loads and span from 5 to 8 inches or more. This floor being practically a single unit, provision must be made longitudinally for contraction by making a continuous joint in the under flooring at intervals with, of course, arrangement for tying the building together.

#### SUSPENDED METAL LATH CEILINGS

Figure 26 shows the plan and also the vertical section of a Metal Lath Ceiling hung from a roof truss. The construction consists of 3 inch channels or I beams firmly secured to the bottom member of the truss. To this is attached one-inch channels spaced about 9". To this Metal Lath is fastened

with galvanized annealed wire, at about every 3". The sheets of the Metal Lath should be lapped and tied together. Plaster is applied to the Lath, after which Cinder Concrete may be filled in between the 3" channels as shown.

Figure 23 shows a Metal Lath Ceiling supported by a Concrete floor slab, a flat bar being suspended by hangers placed as the slab is put in. One inch channels are attached to the flat bar by clips and the channels in turn support the Metal Lath and plaster.

SPECIFICATIONS FOR SILO, USING METAL LATH  
Make concrete foundation deep enough

ping each sheet at the ends and breaking joints each alternate sheet.

Plaster the interior with  $\frac{3}{4}$ " ground using regular plastering material with any approved waterproofing (in Germany skimmed milk is very largely used), taking care that where side walls meet the base a water tight joint is made.

For the exterior lay up the Lath as already described but plaster coat to be  $1\frac{1}{2}$ " ground waterproofed as for interior.

Roof with Galvanized V Crimped Sheet Roofing 24 or 26 gauge or other non-combustible material.

This silo will be fireproof, waterproof, acidproof, with no upkeep expense.

Figure 15 shows the construction of the silo.

#### BUILDINGS PROTECTED BY METAL LATH AND PLASTER

In places where lumber is plentiful and particularly in the Canadian Northwest, where it has been adapted to apartment house construction, there is a type of building which offers great possibilities to one seeking the advantages of a house built of wood and still having good fire-resisting qualities. Figure 13 portrays that the purpose of the designer was to get much the result obtained by covering a wooden wall surface with metal lath and plaster. Metal Lath and plaster is so applied to a wooden constructed building that there is no air-space between the wood and plaster. The wood is thereby sealed in with an incombustible material that lies close enough to the wood to prevent combustion. We have a low cost fire-resistive building with a strong appeal in a locality where lumber is cheap.

#### ELEVATOR ENCLOSURES

The importance of elevator enclosures warrants the best anchorage that can be devised.

Some engineers and experimenters lay stress on the need for a sliding shoe at the top to take care of the movements caused by heat. The author's observation leads him to observe that the best protection is afforded by an absolute bolted or riveted anchorage. The action of the specimen at the New York test, July 17, 1914, which was a three hours' fire, justifies this claim.

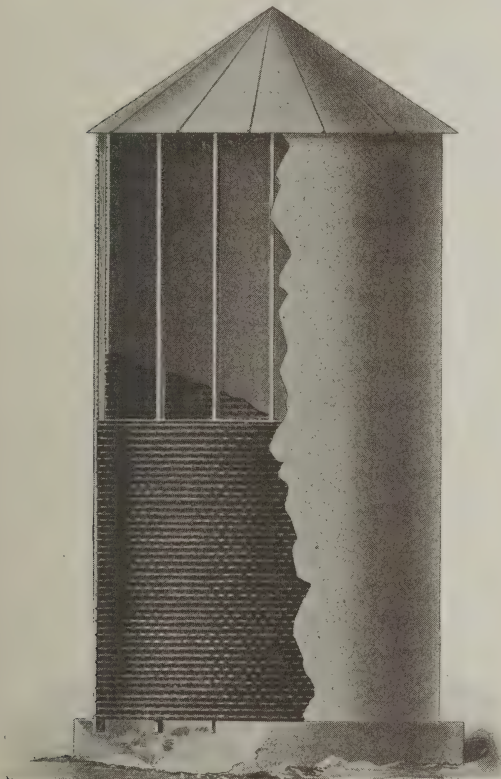


Figure 15. Construction of a Metal Lath and Plaster Silo.

to be a safe distance below the frost line and extending one foot beyond the circumference of the silo required, notch to take ends of 2x4s.

Place 2x4s 16" on centers, using Painted Metal Lath weighing five pounds per square yard. Band the 2x4s on the outside with the Lath sufficient to brace for interior plastering. Nail Lath to inside of studding every 4" using four-penny nails, overlap-



# OUR READERS PAGES



[The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessarily for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experience will be given proper space.—Ed.]

## Answers

### OBTAINING AN ARCHITECT'S LICENSE

Answering "J. H. J.," Chicago:

In order to secure a license you must pass an examination, which is usually held twice a year, either in Chicago or the University of Illinois at Urbana.

The requirements are very strict and requires that one should be practically a draftsman or superintendent in the employ of an architect in order to obtain the required information.

The examination is written and oral and usually requires three days. It takes in considerable drawing as well as specification writing and matters of construction and sanitation.

### SQUARING OF TIMBER

From "Another Northwesterner," Winnipeg:

There are three ways to cut a log, depending upon what you want to get. A

to give the greatest stiffness against both vertical and horizontal deflection. The most lumber is obtained by drawing two diagonals A B and C D at right angles and joining the ends to form a square as in Figure 1.

The strongest beam is obtained by cutting as shown in Figure 2. A diagonal A B is first drawn and divided into three equal parts at C and D. From C and D draw perpendiculars to the outside of the log at E and F and complete the rectangle as shown.

The stiffest log is found by dividing the circle into four equal parts, at C, O and D as in Figure 3, and drawing diagonals from C to E and from D to F. The rectangle is then easily completed.

### METAL LATH

In answer to "C. M. McK.," Indiana:

We are in favor of galvanized or painted metal lath for exterior construction. When

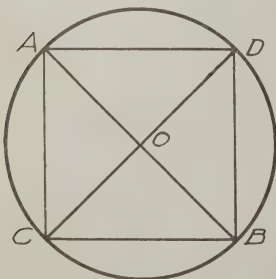


Figure 1.

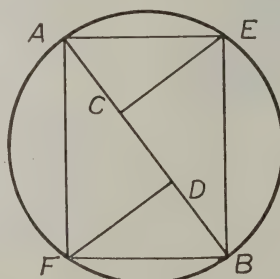


Figure 2.

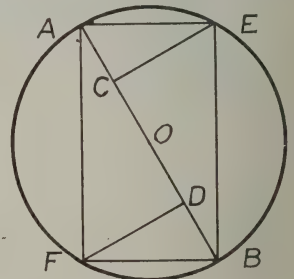


Figure 3.

perfectly square piece may be sawed out, giving the greatest cut of lumber, or a piece may be figured to give the greatest load bearing capacity or one may be made

properly applied, this form of construction should last as long as frame and will not require repainting in order to keep it in condition.

There has been more or less trouble with metal lath which is not galvanized or painted, and on which the stucco was not properly applied.

Wood lath will do for the exterior, provided it is put on carefully and the best quality of lath used and the stucco properly mixed and applied. There is some danger of its drying out the stucco unless a plasterer of discretion puts it on, but no form of stucco construction should be attempted by a man who has not had experience as a plasterer.

#### FLUE LININGS

From "J. H. Maxon," Muncie, Ind.:

The products of combustion from natural gas fires contain very considerable quantities of carbon-monoxide and carbon-dioxide gases. These gases are also in intimate combination with moisture created by combustion of the gas and are soluble in such moisture.

The products of combustion from gas fires are generally conducted from the heater to the outside of the building through flues, which are built of various materials, frequently being constructed of ordinary building brick, with lime and mortar joints, and in other cases, flues are lined with terra cotta or other kinds of tiling.

The flues gases contain carbon-monoxide and carbon-dioxide intimately associated with water of combustion will combine with alkalies that may exist in the brick or mortar and form by this combination bicarbonate of lime, and this chemical reaction in some cases causes the brick and mortar to crumble and disintegrate, and at times, flues will show this on the outside; this being where the material of the flue, of which it is constructed, is very susceptible to such chemical reaction.

Flues lined with terra cotta should not show any material disintegration, and flues lined with vitrified tile would not show any disintegration at all.

The temperature at which the products of combustion, of flue gases, pass through the flue, has a good deal to do with the deterioration of the flue, as the lower the temperature of the products of combustion, the greater the possibility of chemical action taking place, this, on account

of the quantity of moisture that is being carried along with the flue gases.

I cannot attempt to go into a carefully detailed description of the chemical reactions, but the above is approximately a correct statement of the only cause for deterioration that may develop in connection with the linings of flues through which gases from natural gas fires are discharged.

#### HAND SAWS

From A. A. A., Illinois.

In answer to "Young Mechanic," Great Falls, Mont., I have not had but thirty-three years experience with saws, but think I know something about them.

General information: Saws, to begin with, have a disposition, and body, like people, and you must learn to handle them. A real hard temper is hard to get along with. Why? It wears out files faster, the points crumble, cuts no better nor longer.

A thick, heavy saw is like a big, heavy man. It's there with the lubber lift, but not for action. It cuts too wide a channel to work easy.

Don't pick a saw with that hard, fiery ring. There is a hand saw made now that will cut nails. Do you want to buy files, to file a Hack Saw?

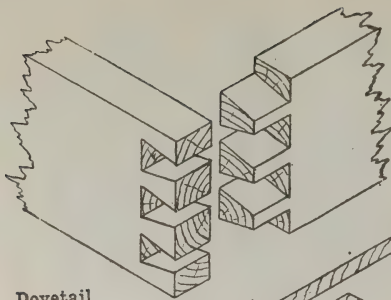
If you have a good temper and shape saw, that is rough and wavy, on sides, and doesn't work good, as they sometimes don't, then remove handle, lay saw on smooth level surface, and give it a good finishing with a double emery stone and oil, first with coarse, and then fine side of stone.

A good soft brick and water is a good substitute.

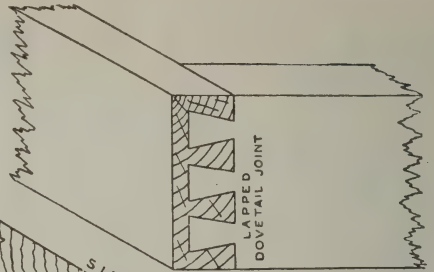
Keeping a saw clean and smooth is half of its working easy.

Now filing is something you must train your eye to, and use your own skill, no device you buy will do it for you. Question best cutting points. Supposing this not to be the fastest cutting points (which are Briar tooth points) but general purpose saws. The shape of teeth of the new saws are good enough, on rip, and back saw, but for cut off, I want more flem, and where it belongs on the front side of tooth, then it cuts like a knife, and not like a scratch awl. That's why. To do this, and

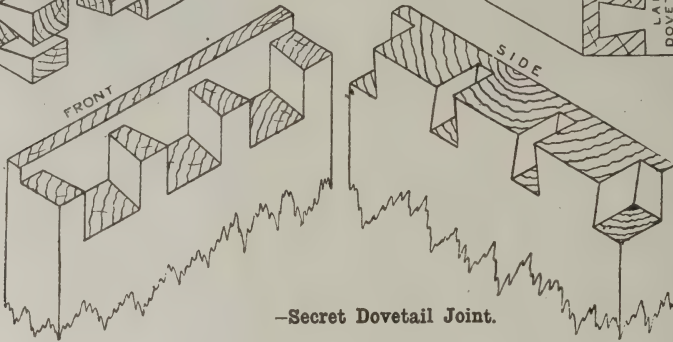




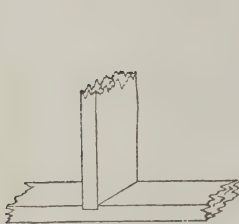
Dovetail Joint.



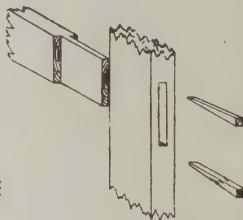
Lapped Dovetail Joint.



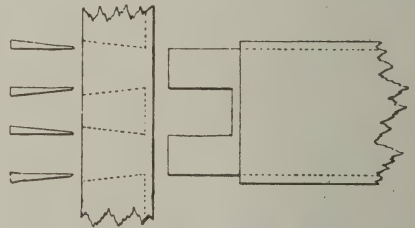
-Secret Dovetail Joint.



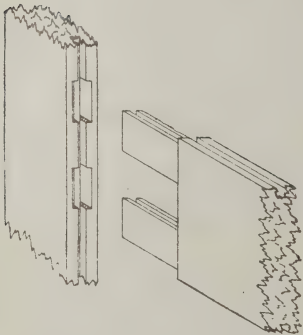
-Housing Joint.



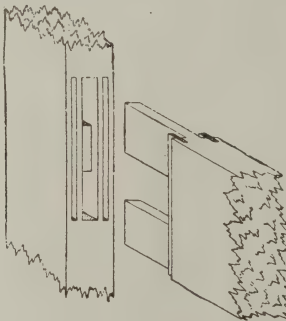
-Tenon and Mortise Joint.



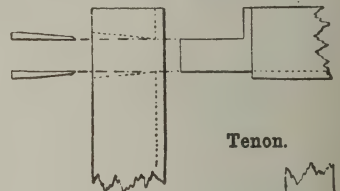
Pair of Single Tenons.



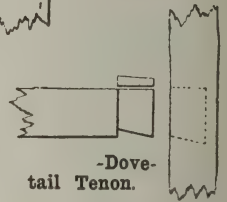
-Double or Twin Tenons.



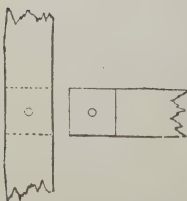
Pair of Single Tenons with Grooves and Slip Feathers.



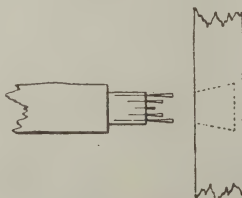
Tenon.



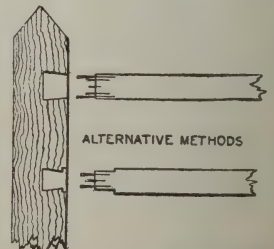
-Dove-tail Tenon.



-Pinned Tenon.



-Foxtail Tenon.



-Foxtail Tenons with and without Housing.

ALTERNATIVE METHODS

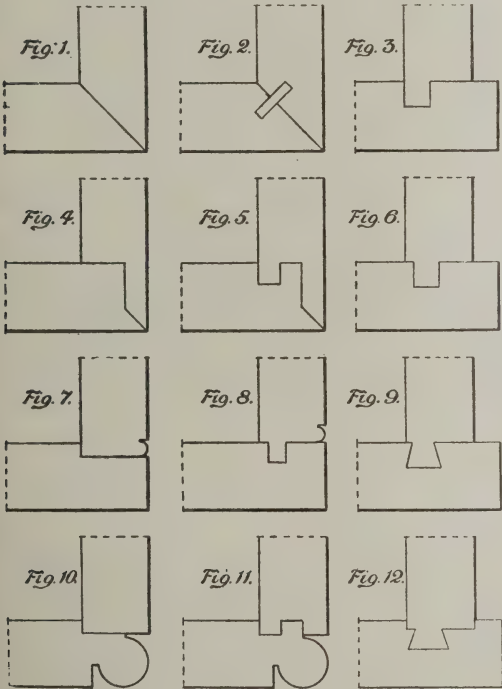
not have that feather edge that breaks off right away, and leaves the tooth dull, file toward the handle of saw and tip the file over and file downward. The more the file is tipped the nearer square the back side of teeth will be, and the more flem will be on the cut side.

This is a little harsh on files, but you get a hard cutting edge from the start, and one that will wear. Why? Because you file against the cutting side of tooth, and leave no feather.

JOINTS.

From "Cabinet-Makers," Erie, Pa.:

I send you herewith a dozen methods of forming right angled joints, that are used in Cabinet-making. There are many more,



but the ones shown are most in use, and are the strongest and most reasonable. I believe these styles are frequently made use of by joiners. Each joint shown speaks for itself.

The full page of joints will give one an excellent idea how they are laid out and cut. A little practice on these will be time well spent. There is nothing quite so fascinating as neat joints like these.

SAFE LOADS ON MASONRY

	Tons per sq. ft.
Kiln dried bricks, laid in mortar.....	8
Ordinary brick, laid in Portland cement.	5
Hard brick, laid in lime mortar.....	6
Hard brick, laid in Portland cement and lime mortar.....	9
Hard brick, laid in Portland cement and mortar .....	12
Pressed brick, laid in lime mortar.....	8
Pressed brick, laid in Portland cement mortar .....	14
Rubble stonework in lime mortar.....	4
Rubble stonework in lime and cement mortar .....	6
Rubble stonework in Portland cement mortar .....	8
Concrete, one part cement, two parts sand and five parts stone.....	15

BUILDING A PIT SILO.

From "I. W.," Chicago:

For a number of reasons, we do not consider it advisable to build pit silos. As usually constructed, the walls consist of mortar applied directly to the sides of the excavation. Entire dependence is therefore placed upon the stability of the earth walls, which we do not consider good practice.

Another objection to underground silos is the difficulty in removing the silage, as unless a special lifting device is installed the silage must be carried out by hand, which is a very laborious process, especially where a large number of cattle must be fed from the silo.

The chief objection, however, is the danger resulting from the accumulation of silage gas, otherwise known as carbon dioxide. This gas is approximately one-half heavier than air and, therefore, will not rise to the top and pass out unless distributed by some mechanical means. Instances have been known where people have become overpowered by this gas and lost their lives.

An instance has but recently come to our attention where this gas caused the death of four inmates of the Ohio State Hospital, at Athens, Ohio. The silo in question was not a pit silo, but the doorways were closed to a height of about 6 feet above the silage. The men entered previous to starting the cutter to complete filling and apparently laid down upon the silage while waiting





roofing, wall board, etc., and some do not. Others have different side lines. All of these side lines can be taken care of in a merchandise account or a separate account can be opened to look after them; it depends entirely on the will of the management which method shall be used. I used only a small number of accounts as the business was a small one. Our expense was divided into a labor account and a general expense account. In most yards it is advisable to have a teaming account, a yard labor account and an office labor account as well as several other specified expense accounts. This can be determined by the size of the expenditures for these different purposes. We ran all teaming labor through our labor account and carried accident insurance on our men accordingly. The office labor, etc., was simply run through the general expense account. In a case such as suggested in the question, it would be necessary to open a labor account and divide it into four units, as follows: Yard labor expense, factory labor expense, office labor expense, and glazing labor expense. In this way each separate department can be made to stand on its own bottom. This is a very desirable point in the conduct of any business, as it can then be readily ascertained at the end of each year exactly how much is made from the output of each unit of the business.

In arriving at the cost of handling lumber per thousand it is, of course, first necessary to reduce everything to feet. This can be accomplished by following the methods as set forth here. In the case of posts, take the nearest sized square and figure the number of feet therein. In the case of lath, figure that ten lath make one foot of lumber. In the case of shingles, figure that five shingles make one foot of lumber. In the case of sash, doors, mouldings, etc., it is more or less guess work, but with a little careful thought this stock can be approximated into feet also. By adding the total of all these items, it is possible to find exactly how much, in feet, has been handled during a given period. This total can be divided by the total expense and in this way the exact cost per thousand feet for handling all material during the same period can be determined. It may not be desired to find out how much it cost to handle material in total, and should it be desired to find

out only what it has cost to handle the lumber end of the business, the answer can be arrived at in the same way, by using only the total feet of actual lumber handled and dividing that by the total lumber expense, which would be contained in the yard labor and expense, and a proportionate amount of the office labor and expense. This method can also be applied to any of the various other representative accounts.

The case suggested in the question would require accounts as follows:

- Lumber
- Lath
- Shingles
- Posts
- Merchandise
- Glazing.

These accounts to be the representative or stock accounts, where a complete record of all the sales or purchases should be posted. There should also be opened expense accounts as follows:

- Yard Labor
- Office Labor
- Factory Labor
- Glazing Labor
- Yard General Expense
- Office General Expense
- Factory General Expense
- Glazing General Expense

It must be understood that it is necessary to have a personal property account and an improvement account, where all items of personal property and improvements must be posted; they should not be posted to the expense account. For instance, if a horse is purchased, he is not expense, but personal property; he is an asset. If a shed is built, that is not expense, but improvements; it is also an asset, in the same way that a horse, wagon or other necessary equipment is an asset. The personal property account and improvement account should, of course, have about ten per cent deducted each year for depreciation, and this will make up for such items as a horse dying and a new one being added to personal property. If it were not for this deduction, the company would have two horses charged up and only one to show for it. You do not have the dead horse charged to your personal property account, because you are deducting something each year to make up for the added asset which the new horse will be after his purchase.



The same applies to a rebuilt shed. It is to be remembered, always, that it is better to carry insurance on too many assets than too little.

It is well while on the subject to say a few words regarding insurance. This detail should always be considered the most important and vital part of the expense. It is really not an expense at all, but an investment. One fire with no insurance or not enough insurance would cost the company more than enough to pay for the insurance for a good many years. My employer at the yard mentioned in this article was a man who actually seemed to find pleasure in paying for insurance. He never had but one fire, and that a comparatively small one; however, he feels perfectly safe

at all times and does not worry at all about this sort of misfortune, for the reason that he always carries enough to reimburse him in full should another fire wipe out the yard. It is to be hoped that any retail man who reads this article and who has not been carrying enough insurance will, for his own good, take out enough more to play safe, at once. We never know who will be the next to suffer by fire.

This general outline of a cost system can, of course, be enlarged upon, or the essential parts can be taken and a system suiting the individual taste can be put into use. All the necessary suggestions are, however, handled here, and by using this method as a foundation, a very satisfactory cost system can be worked out.

## Questions

### WEIGHTS OF CROWDS

From "Builder," Erie, Pa.:

Are there any rules for getting the size of joists, to sustain a given number of people in a room, or per square foot of floor?

### BRICK CHIMNEY RULES

From "Young Bricklayer," Detroit, Mich.:

Please give me some information as to thickness and size of brick flues.

### PURLINS

From Dawson, Dawson City:

Will some kind reader publish a method of finding the bevel of a Purlin on a hip-roof?

### SCAFFOLD BRACKET HOOKS

From "Builder," Davenport, Ia.:

Will some reader please describe and publish sketch of scaffold bracket hook, and how to fasten same to bracket? Please state size of iron and dimensions plainly.

### BUILT UP ROOF

From "A. A. G.," Preston:

I am about to build a rink, some 80x100 feet wide, and would like to get some pointers as to the roof of such a building. There will be no supports for the roof but the

walls, so it must be self-sustaining. It is to be semi-circular and covered with corrugated iron. Any information will be much valued.

### A TRUE LEVEL

From "C. M. N.," Illinois:

How can I tell when a level is "out of true," and how can it be fixed? I want my level to be exactly right, and I want to know that it is.

### EMPLOYER'S LIABILITY

From "O. M.," Illinois:

I would like very much to know how the "Liability Law" affects the contractor who employs, say eight or ten men. A part of the work is contract and part day work. Is he liable to damages for an accident if work is done by the day? Also is he liable if an accident happens by the workman's own carelessness, and if so what is the remedy?

If he has to take out insurance, can he keep it out of the employee's wages?

### BUILDING A BOAT

From F. A. S., Wisconsin

I should like to have some of our readers publish the best way to build a 14 ft. boat for easy running.



## LEGAL DECISIONS OF INTEREST TO BUILDERS

*Prepared for the*  
**NATIONAL BUILDER**  
*by George H. Murdock*

Though the principal contractor was not entitled to a lien because the contract was not recorded as required by Code Civ. Proc. §1183, sub-contractors, who performed labor and furnished materials, are entitled to a lien.—*Watterson v. Owens River Canal Company*, 143 P. (Cal.) 90.

Where work under a contract was stopped by mutual consent, and there had been no subsequent offer by plaintiff to perform or refusal by defendant to permit a completion of the work, there was no breach of contract, however long the suspension continued, which would entitle the plaintiff to sue for loss of profits.—*Dreyer v. McCormack Real Estate Company*, 149 N. Y. S., 322.

Where, after work under a contract had been stopped by mutual consent before

completion, plaintiff sued and recovered judgment for work already done, there having been no default by either party, plaintiff could not in that action have recovered for loss of profits under the contract, and hence the judgment was not *res judicata* against a subsequent action therefor.—*Dreyer v. McCormack Real Estate Company*, 149 N. Y. S., 322.

Where a surety, in pursuance of the terms of his undertaking, assumes the performance of the principal's contract, he becomes necessarily subject to all of his liabilities, and hence a surety, who completed a construction contract, is entitled to no lien for his work, where the contractor was not entitled to one because the contract was not recorded.—*Watterson v. Owens River Canal Company*, 143 P. (Cal.) 90.

## Book Notices

Notice—All books noticed in these columns may be obtained from this office at publishers' prices. All postage or express prepaid. (Money and address must accompany all orders.)

**Concrete Stone Manufacture**—By Harvey Whipple, Managing Editor of *Concrete Cement Age*—Published by the Concrete Cement Age Publishing Co., Detroit, Mich. Price prepaid, one dollar. This is a timely book, just come in a season when it will be of the greatest service to the owner, as it is full of most modern and useful information regarding the use and manipulation of Portland Cement. The book is illustrated with over 125 fine photo-engravings which show examples of work and instructions of "how to do it," proper proportions of cement, sand

and gravel, or other materials to be employed, in the formation of the work shown, along with hints regarding the mixing of the cement for various purposes, the time required for good "setting," and many other things a "Concretor" is supposed to learn in his regular business to make him a finished workman. The manual is printed on fine book paper, and handsomely printed in fairly good sized type and covers over 250 pages. It is bound in flexible leather, pocket size, and will be welcomed by every Concretor as a useful helper and wise assistant.



# Boston Prices For Lumber

	SPRUCE	L. L. Y. P.	S. L. Y. P.
2 x2—2x2½—2x3—2x4 2½x4—3x4—2x6—2x7 2 x8—3x6—3x7—3x8—4x6—4x8 2x 9—3x 9—4x 9 2x10—3x10—4x10 2x12—3x12 4x12—6x12—8x12—10x12—12x12 14-inch 16-inch "Squares"	20 ft. & under. \$30.00 31.00 32.00 33.00 30.00 32.00	Up to 28 feet. \$30.00 37.00 42.00 42.00 50.00 30.00 34.00	Up to 28 feet. \$25.00 26.00 33.00 37.00 42.00 50.00 30.00 34.00

Note:—\$1.00 extra for each 2 ft. over 20 ft.

¾-in. and 1½-in. white pine cornice, sound knotted.	55.00
¾-in. and 1½-in. cypress cornice, clear.	60.00
¾-in. and 1½-in. cypress cornice, select.	50.00
6-in. red cedar or redwood bevel siding, clear, 8 to 16 feet.	30.00
6-in. white pine, clear, 12 to 16 feet.	45.00
6-in. white pine, No. 2, 12 to 16 feet.	40.00

## ROOFING, T. & G., SHIP-LAP OR SQUARE EDGE.

¾x5½-in. face, N. C. pine, 10 to 16 feet.	26.00
¾x7½-in. face, N. C. pine, 10 to 16 feet.	28.00
¾x9½-in. face, N. C. pine, 10 to 16 feet.	28.00
1½x5½-in. face, N. C. pine, 10 to 16 feet.	30.00
¾x5½ to 7½-in. spruce.	30.00
¾x5½ to 7½-in. hemlock.	26.00

## FLOORING.

¾x2½ to 4½-in. N. C. pine, or yellow pine, flat grain, No. 1, 10 to 16 feet.	35.00
¾x2½ to 4½-in. N. C. pine, or yellow pine, flat grain, No. 2, 10 to 16 feet.	30.00
¾x2½ to 4½-in. N. C. pine, or yellow pine, flat grain, No. 3, 10 to 16 feet.	24.00
¾x2½-in. N. C. pine, comb grain, No. 1, 10 to 16 feet.	47.00
¾x2½-in. N. C. pine, comb grain, No. 1, 10 to 16 feet.	38.00
¾x2½-in. yellow pine, comb grain, "A Heart," 10 to 16 feet.	75.00
¾x2½-in. yellow pine, comb grain, "A Sap," 10 to 16 feet.	55.00
¾-in. maple flooring, 2 feet and up, clear.	60.00
¾-in. maple flooring, 2 feet and up, No. 1.	55.00
¾-in. plain oak flooring, 2 feet and up, clear.	75.00
¾-in. plain oak flooring, 2 feet and up, selects.	65.00
¾-in. quartered oak flooring, 2 feet and up, clear.	115.00

## SHINGLES

18-in. red cedar, "Eureka"	5.00
18-in. white cedar, XXXX.	7.00
18-in. white cedar, clear butt	6.00
16-in. white cedar, extra	4.50
16-in. white cedar, clear butt	4.25
6x18-in. cypress, No. 1, Heart (on 6-in. basis)	11.00
6x18-in. cypress, No. 1, Sap or "A" (on 6-in. basis)	9.00
6x20-in. cypress, No. 1, Heart (on 6-in. basis)	14.00
6x20-in. silver gray cedar, No. 1 (on 6-in. basis)	18.00
6x20-in. silver gray cedar, "A" (on 6-in. basis)	15.00

## CEILING.

½-in. N. C. pine ceiling, clear, one side, 10 to 16	30.00
½-in. N. C. pine ceiling, No. 2, one side, 10 to 16	24.00
¾-in. N. C. pine ceiling, clear, one side, 10 to 16	30.00
¾-in. N. C. pine ceiling, clear, one side, 10 to 16	35.00
¾-in. N. C. pine ceiling, clear, two sides, 10 to 16	40.00
1½-in. N. C. pine ceiling, clear, one side, 10 to 16	37.50
1½-in. N. C. pine ceiling, clear, two sides, 10 to 16	40.00

	C.Y.P.	Y.P.	W.P.
4¼-in. moulded casing	\$2.75	\$2.25	\$3.30
4¼-in. moulded base	3.00	2.50	3.75

## SLATE.

Sea green, No. 1	\$4.10 to 4.50
Bangor, No. 1	4.75 to 6.25
Peach bottom, No. 1	5.10 to 5.35

NOTE.—These prices are for less than car lots delivered on the job, within reasonable limits in Boston and the adjoining districts.

# The Contractor and the Millwork

CONTRACTORS, being human, are readily divided into several classes.

One, through early training, may incline to masonry. To him the woodwork about the building is a necessary evil, to be tolerated when necessary, but to be relegated to the carpenters as soon as the real builders, the masons, are off the job.

Others are more or less unconcerned about the woodwork, except where it gets in their way. This class, embracing what are generally classed as the "Sub-Contractors," takes in the plumbers, and electricians, who cut and mistreat the floor framing, studdings and even the rafters with little system or judgment. They would cut and hack a masonry wall if they could, but it is too hard on their tools. They, to the carpenter, are a necessary evil, to be put up with during their reign of terror, for no one can determine where they will have to cut next.

Another class is or should be a strong ally for the carpenter. This takes in the painters and decorators and those who embellish the building. When, as they usually do, they work with the carpenters, the result is a building pleasing to the owner and a pattern for others to follow.

The class with whom we have to deal just now is the carpenter, and especially to that branch which installs the finished woodwork. We see his handiwork from the street; we glance at the exterior trim, porches, the front door. Even the style of the hardware is impressed upon us as we touch the electric button and the door handles. The carpenter can make or mar the entire building just by his treatment of the exterior.

But when we enter the house we are even more struck with the necessity for good judgment on the part of the contracting carpenter. The first step on the floor tells us a lot about the carpenter's character. The inside trim and doors, the colonnades, grilles, bookcases, mantels, china closets, cupboard, each tell how judicious the contractor was in his selection of materials as well as in the installation of it. The general thought he has given the subject will be apparent in the whole, rather than in individual cases, for

the appearance of the finest mantel will suffer if inferior moulding, base, floors, etc., come near it.

The contractor must therefore be an all around judge, but must make his decisions before the work is started. Anyone of your clients can tell you whether they like the house after it is finished, but it is up to you to know what will give satisfactory results. You cannot tear out partitions and build new colonnades, change over the size of doors and windows, except at considerable expense; even then it is a job of patchwork instead of a well thought out piece of work.

There is not much excuse for the contractor of today being behind the times. Every opportunity is given him to acquire an education in his field. Many books of excellent designs and details are within his reach. Numerous magazines cater to him. The manufacturers of the material he uses are always ready to show him the advantages of their goods and instruct him in their use. Catalogs and samples are his for the asking, and if he remains in ignorance it is largely his own fault.

A great many contractors, however, and particularly those who began business life as apprentices, are not as well grounded in the elements of design and appearance as they should be. In construction they may be well nigh perfect, but not in the subject more refined, requiring a decision as to quality rather than to utility. The buildings which they plan and erect will be weather-tight and permanent no doubt, but they will lack the touch of refinement which makes an appeal to their clients. The contractor should study the effects which can be obtained with different materials, finishes, combinations, plans, etc., and be prepared to give his buildings that final touch which will make it as something different and better than the neighbors and give him the credit for being at the head of his craft.

As we said before, it is not a matter of workmanship alone, there must be the material also, and not alone the material properly put in place, but finished by the painter and decorator. It must not only be permanent construction, but it must



harmonize with the quality, furniture, pictures, etc., of the owner or tenant.

The contractor's knowledge must start with the raw materials. He must know the native and foreign woods used in building, their characteristics and relative cost. He must know which are easily obtainable in sizes to do his work, the ones susceptible to moisture must be avoided, and the various processes of seasoning and preparing.

The carpenter is mostly interested in his tools, while the contractor must consider a vast number of questions. Not only must he know the materials, but he must know whether the men available can fit it in place. Special tools are needed in every trade, and it is folly to attempt good work without being equipped for it.

No greater mistake is ever made than to assume a know-it-all attitude. In the first place, no one has reached that place and there is always something new coming up. It may be Mission furniture and trim, sleeping porches, sun parlors or texture tile for exteriors. Does the contractor know about it? If he does not some client will ask him and it never pays to be ignorant. Of course, you can come back the next day with a fine answer, but that doesn't do at the time.

The contractor should visit the mills where regular and special work is turned out. Nothing else will so instruct him, and he will see why it takes time to get out special designs of special stock. The routing through the mill, from the estimating and listing to the final delivery on the job will show him where he can make the work on the job tie in better with the shop work. It will show him why accurate dimensions are necessary for stairs, mantels, etc., and why some work cannot be started until the building is well under way, so these measurements can be taken.

Most of all, perhaps, is the idea of system which attends every movement in the mill, and the accuracy with which every movement must be carried out. Every line of every moulding, the length, width and thickness of every piece, the length of tenons, location of dowels, everything is settled, determined and worked to. When the system is understood it is easy to see why few mistakes occur.

Now, when a hundred pieces such as doors, just alike, are made there is no delay in getting the component parts out, because the machines are set and the whole hundred run through at once. It would take nearly as long to set the machines for one as for the hundred, and that is one reason why special work costs money.

Perhaps not only special sizes are wanted, but special mouldings. This means not only setting the knives and blades, but grinding them to the necessary shape. The actual time the blades are in use is only a small fraction of the entire time required on the work, and the tools suffer far more than in running a thousand stock pieces.

The owner pays for all this extra work and time, and the contractor should try to save some of it. He can do it by ordering stock sizes and styles, standard mouldings and the customary woods. There is plenty of variety at that to satisfy the most exacting client.

Every part of the house can receive special study. The doors may be of various woods in many styles. The floors may be finely finished oak or parquetry. Mantels, plain or elaborate, are useful as well as ornamental. Grilles, colonnades and cased openings offer a field for careful study. In the kitchen one finds cupboards, the shelves of which should be more than just thrown in any old way.

Few contractors realize how much they can help their own game by attention to what seems like small items, a coal chute in the basement, a medicine cabinet in the bathroom, mirror doors in the bedrooms, etc. Such items add to the cost, but when the owner knows about them the contractor is bluffed into furnishing them gratis or chided for not thinking about them before the work was started. Why not give the owner a complete home? Why not, in a cold climate, include storm sash? At the same time figure on screens for all the doors and windows. Use the best screens, too, and cover the whole window. Hang the screens on the same hangers as the storm sash. See that they are numbered, so it won't be a case of trying half a dozen times before you get the right one. Arrange a screened porch whenever possible, and have it fixed so as to be a sunporch for the winter. Keep

# Whatever is Worth Building is Worth Building Well

## *To Builders*

who know that a reputation for building well is a valuable asset we can offer unusual advantages.

**Good Millwork** and **Good Service** are indispensable.

With—a mill that we believe is the largest in the country devoted exclusively to contractors' trade.

Above seventy-five carloads of Millwork, Glass and Paint always on hand.

Over a million feet of shop lumber of the best grade in our yards.

Cut stock, K. D. stock, frame stock and veneered stock partly machined enabling us to furnish a large part of the special work in a fraction of the usual time.

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Write for Sash and Door, Mantel, Art Glass or Paint Catalog

**The Cleveland Window Glass & Door Co**  
**CLEVELAND OHIO**





your wits about you, especially when planning where the women are concerned.

How much should the contractor know? Well, the more he knows the more money he makes, the easier he gets along and the more people think of him, if that counts for anything. How can he get the necessary information? Only by hard work, study, reading and observation. The manufacturers of standard and special materials have catalogs of millwork, lumber, trim sash, doors, frames, grilles, colonnades, mantels, bookcases, cupboards, screens, mouldings, etc., tables showing sizes, prices, weights and other information. Where it is possible, generous samples are given away, to interest as well as instruct the contractor. While shops and plants everywhere are open to the investigating mind, not enough attention is given to these sources of formation. Possibly if every catalog cost a dollar or more one

would be more inclined to save it as carefully as he does the more expensive textbooks.

One must not overlook the many excellent books published in the interests of better building. How can we have better buildings if the contractors don't have a hand in it? So it is up to the contractor to know his business. Those who do are reaping the reward and are busy. The others are telling how hard times are and how they used to get along. Well, none of us know so much now, and it isn't that they know less, but that we know more. If times are a little dull, that just means we must get busy and find the cause, find how to do more work for less money and at less effort. Others are reading catalogs instead of throwing them in the scrap pile, and are keeping posted on new materials and new methods. Keep at the top and don't let anyone out-know you.

## Our Advertisers' Symposium

### Mantels, Fireplaces and Tiling in the New Hotel Morrison

It will interest the readers of the NATIONAL BUILDER that we were awarded the contract for furnishing all the fine fireplaces, mantels and tiling for the new Hotel Morrison of Chicago. This hotel, when completed, will be one of the finest in the world, and everything in it must be of the very best grade.

We believe we take only commendable pride in the fact that our goods are recognized as maintaining the high standard required for this contract, and we assure everyone of you that the orders you send

us are given the same care and thought as the large contract mentioned above.

Our staff of designers are prepared to make a study of your requirements from color schemes, harmonizing with the exterior and interior of the building, as well as designs correct in themselves. The many clubs, hotels, public buildings, as well as residences to which we can refer inquirers, is an evidence of our ability to please you with either stock or special designs. Let us hear from you when considering fireplaces, mantels, tiling or similar work.

CHARLES F. LORENZEN & Co.,  
101 N. Clark St., Chicago.

### Screw Holes That Hold

Don't put screws in wood—the thread in the hole wears out and the hole has to be plugged.

Use Stine Screw Holes, made of brass, driven into the wood. Will hold the screws tight everlastingly.

Furnished in all sizes for all kinds of work—wood, glass, marble, plaster of paris, stucco, cement and all kinds of metals.

Samples free to architects, contractors and dealers. Write today.

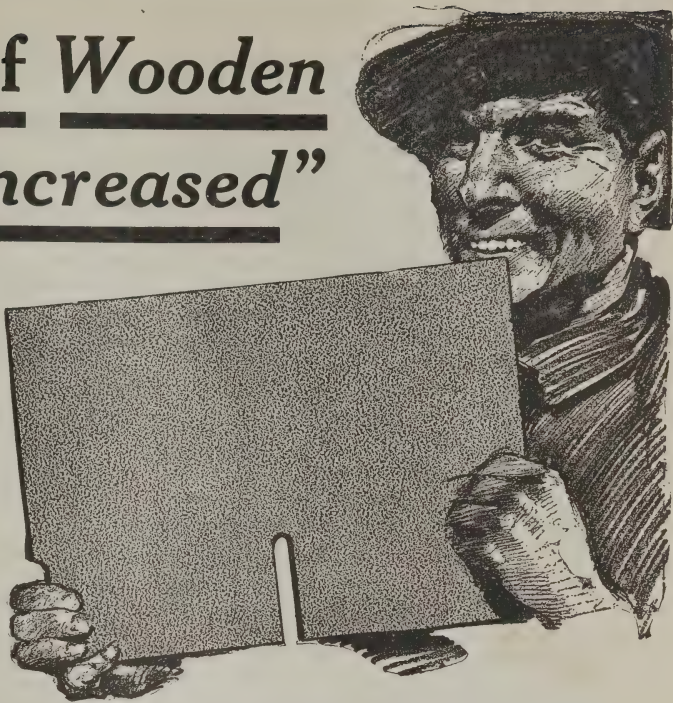
**STINE SCREW HOLES COMPANY**  
Corner Main and North Decatur, Ill.

### Sap Clears for Enamel Trim

Many contractors are face to face with the problem of finding a trim that will take enamel in a satisfactory manner. Scores have ended their search for such a wood by discovering that Arkansas Soft Pine Clear Saps meet every requirement. This lumber is perfectly manufactured and perfectly cured. It is as white and light as any pine ever manufactured in the United States. It possesses all the advantages of Arkansas Soft Pine with the ex-

# “My Sale of Wooden Shingles Increased”

“When I first took on the NEPONSET Shingle I expected it would cut into my wooden shingle business. Instead, NEPONSET Shingles advertised *me and my business*, and *increased* my wooden shingle sales.”



## NEPONSET Shingles

PATENTED

are not ordinary composition shingles. They are built up *individually*. Made in pairs to reduce laying cost.

The greatest roofing development of the 20th century. Any carpenter would be foolish to overlook this new *yet time-tested* product.

The same materials are used in **Neponset** Shingles as in the well known **PAROID** Roofing, also used in **Neponset** Proslate, the highest grade colored ready roofing ever made. **Neponset** Wall Board, **Neponset** Waterproof Building Paper and **Neponset** Floor Covering are other well known **Neponset** products.

**Bird & Son, Dept. N, East Walpole, Mass.**

Please send me a sample of the NEPONSET Shingle. This does not obligate me in any way whatever. Also send copy of your booklet “Repairing and Building.”



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WRITE TO ADVER-



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ception that there is very little, if any, figure in it.

It is in recognition of the trend of the trim trade that this special grade is being assembled and contractors can rest assured that on proper representation they will be able to get this high quality product. In the event any difficulty should be encountered, it might be well to take the matter up with us direct.

THE ARKANSAS SOFT PINE BUREAU,  
608 South Dearborn St., Chicago, Ill.

### The New Flooring Problem

Enamel woodwork, now rated "the latest thing" in interior trim, calls for a floor to harmonize therewith. The new trim is made in rather severe lines and very simple patterns. The plain enameled surface is relieved by an occasional touch of color secured by using mahogany or birch stained mahogany, for window stools, stair rails, etc.

Considerable attention has been given this problem by the thoughtful architect, contractor and owner. Many architects have found that the utmost harmony and most gratifying effects can be obtained by using Red Clear Beech or Birch, or White Clear Maple, finished in natural color. An equally pleasing floor and one that costs slightly less, is secured by using the regular clear grades and neutralizing the tone when the floor is finished. Such floors assure the owner maximum service, as Maple, Beech and Birch make the most durable floor of any wood. That is one of the vital points to bear in mind when building. These kinds of flooring give that light, dainty effect which is so much desired and is absolutely in keeping with the new trim.

We have information which should be in the possession of every contractor. Ask us for it.

THE MAPLE FLOORING MANUFACTURERS'  
ASSOCIATION,  
Stock Exchange Bldg., Chicago, Ill.

### A Timely Tip on Screen Material

Out of the hundreds of varied screen materials marketed under various names and trademarks, just one stands out as absolutely in a class by itself.

The screening manufactured by Gilbert & Bennett and sold under the trademark

PEARL has proven itself easily the peer of them all.

When you get right down to bed rock, the one thing on which screening should be judged is the length of time it wears. Genuine Gilbert & Bennett PEARL has established wear records that are little short of miraculous and so far outstrip the best performance of other similar appearing materials as to make them seem mere makeshifts.

One enthusiastic user says: "There is as much difference in the life of PEARL and the galvanized screening I used to use as between a paper bag and a steel box." Possibly that is a little overdrawn. Nevertheless, Gilbert & Bennett PEARL possesses wonderful wear qualities.

The big enemy of screening is rust. PEARL is as near rustproof as metal can be made, which explains its wonderful durability. The coating and application from which PEARL derives its wear quality is a secret process exclusive with the Gilbert & Bennett Manufacturing Company. Other manufacturers can not produce a wire cloth which equals genuine PEARL, simply because they do not know how.

The actual cost of wire cloth is so small an item as compared with the frames and labor that one can not afford to use anything but the best. PEARL certainly answers to that description. To make sure of the genuine article look for the two copper wires in the selvage and the name "Gilbert & Bennett" on the round tag attached to every roll.

THE GILBERT & BENNETT MFG. CO.,  
38 South Dearborn Street, Chicago, Ill.

### Parquetry Flooring.

That a floor is a most important part of a building is obviously true. That the beauty of a room depends to a great measure upon the beauty of its floor is likewise a self-evident fact, for when one enters a room one's first act, whether conscious or unconscious, is to look at the floor upon which one is walking.

The ideal floor is one which combines with beauty, variety, durability, economy and cleanliness. That parquet flooring combines these qualities has been the opinion of Europeans for hundreds of years, and it is an actual fact that practically

no flooring other than parquetry or Herringbone is laid in any of the European countries, and this statement is a fact to which there are practically no exceptions. The leading architects of the east and all the large centers use it exclusively in high class buildings.

The flooring is made in squares of various sizes and in herringbone strips of various widths and lengths. The squares are formed with two or more pieces of flooring so cut to length and end matched that the length and width are equal, and these squares are of various sizes so that the small ones can be used for foyer halls and small rooms, in keeping with the scale of the room, and the larger ones in the proportionately larger rooms. The herringbone strips, too, are made in various lengths and widths, so that they lend themselves equally well to the proportions of any room.

The above matter gives a rough idea of the effects which can be obtained in parquetry. Squares can be laid diagonally or oblongs can be laid either straight or diagonally, and the use of quartered oak lends, of course, an added beauty. Many of the large restaurants and hotels have put down herringbone floors for dancing, as the feet naturally travel with the grain of the wood and never across, as must be the case in strips laid the length of the room.

LAWRENCE OTTINGER,

President Federal Parquetry Mfg. Co.,

175 Fifth Ave., New York.

### Oak Flooring vs. Carpets.

The average home builder is very often misled in regard to prices on oak flooring. Three-eighth inch thickness oak flooring, which makes a very serviceable and beautiful floor, is cheaper than carpets. A yard of carpet is 27 inches wide by 3 feet in length, thus a carpet yard contains  $6\frac{3}{4}$  square feet. Carpet sells at from \$2.00 to \$9.00 per yard. A fair average of good quality of carpet would be about \$3.00 per yard. The best grade of  $\frac{3}{8}$  inch clear quartered oak flooring by  $1\frac{1}{2}$  inch face or 2 inch face can be laid and polished for \$1.50 per carpet yard. This is one-half the price of carpet. Carpets over the entire floor is a product of the past, and

rightfully, too. Oak floors with rugs meets the demands of people that know how to have their home look up to date. Oak flooring beautifies any home and combines more taste and a greater degree of refinement than any carpet that was ever made.

The living, renting and selling values are vastly increased by oak flooring. Three-eighth inch thickness is used very extensively for reconstruction work where it may be laid over old soft pine floors or carpets without in any way interfering with the woodwork of the room.

The standard thicknesses of oak flooring are  $\frac{13}{16}$  inch and  $\frac{3}{8}$  inch. The former comes in  $1\frac{1}{2}$  inch, 2 inch and  $2\frac{1}{4}$  inch faces and the latter in  $1\frac{1}{2}$  inch and 2 inch faces. The  $\frac{3}{8}$  inch thickness when laid has all the appearance of heavy flooring.

Oak flooring is hygienic and is very easily and economically cared for after being laid. No modern home nowadays is complete unless floored with oak flooring.

W. L. CLAFFEY,

The Oak Flooring Bureau,

897 Hammond Bldg., Detroit, Mich.

### Buying Millwork Direct

Many contractors are purchasing millwork direct because they must have quality, service and low prices. Our facilities for meeting all of these conditions are exceptionally good, as we usually carry over 100 carloads in stock of all kind in millwork, glass and paint, besides thousands of feet of high grade lumber ready to be worked up into modern millwork. We have our own mills as well as our own Art Glass Beveling and Silvering shops.

A feature of our proposal to NATIONAL BUILDER readers is to pay the round trip transportation east of the Mississippi and north of the Ohio to any builder who will come to Cleveland, go through our plant and purchase \$100 worth of woodwork material. Besides this, our terms are liberal and elastic, allowing credit to responsible contractors, as well as large discounts for prepayment. Our catalog will be of interest, as it gives prices and full information regarding all of our materials.

CLEVELAND WINDOW GLASS Co.,

209 Champlain Ave., Cleveland, O.



### Millwork Salesmanship

In a large number of lines of business there has been a steady and sure change in methods of selling. Formerly price was the whole thing. Today quality comes in for most consideration. The most substantial and successful merchants in any town today are those who sell their wares from a quality standpoint first.

Dealers in doors and millwork, as well as contractors, must take this lesson to themselves. They must do business at the happy medium stage, emphasizing quality first. They must skillfully avoid the "Cheap John" sale on one side and the "Highbinder" on the other side. They must sell on quality and service, without cheapening themselves by a no-profit price, or robbing their customers by holdup methods.

Morgan Doors are guaranteed not to shrink, sag, peel, crack, or twist. If they do any of these things, provided, of course, that they receive proper treatment after leaving our hands, the doors are replaced

free. The owner will appreciate what a great pleasure it is to have doors in his home that hang true and that open and close with a satisfying snap, instead of an irritating creak or rattle.

Morgan Doors are not high priced, but they back up by actual performance every quality argument that you wish to make to the buyer.

There are almost as many grades of door quality in this country as there are manufacturers. During the past forty years Morgan Doors have been made the highest standard of door quality. They are advertised in the national magazines to the people and have made good everywhere. Dealers can add much to their reputation for handling quality goods by lining up with Morgan and getting in touch with their sales promotion work.

MORGAN SASH & DOOR Co.,

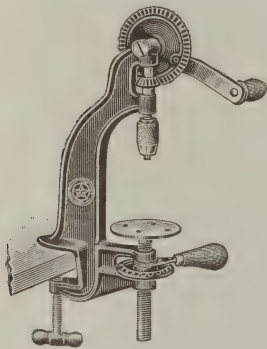
Department A 22,

Building Exhibit, Insurance Exchange,  
Chicago, Ill.

## TRADE REVIEW

### Bench Drill Press No. 208.

An attractive bench drill press of very moderate cost and known as No. 208 has just been put on the market by the Millers



Falls Company, of Millers Falls, Mass. It is made in accordance with the usual standards of these well-known manufacturers. The illustration here-with will show its general lines and character. The finish of the standard is gray with red

edging and such parts as chuck and crank are nickeled. The chuck has a capacity of 0 to  $\frac{1}{4}$  inch for round shank drills and is of the popular Star pattern with three jaws operated by springs that are protected from injury and guaranteed not to get out of order. The small gear is of steel and the tool is equipped with ball bearings. The chuck is held rigidly close to the main frame and feed is obtained by raising the table with a

ratchet lever. The table is provided with holes for the insertion of pins or screws to act as stops or rests for the work. The height over all is 18 inches; maximum distance from chuck to table  $4\frac{1}{2}$  inches; speed of gears,  $3\frac{1}{2}$  to 1; weight,  $7\frac{1}{2}$  lbs. Each bench drill is packed in a separate wooden box.

The Millers Falls Co. has a circular of this Bench Drill, which they will be glad to send to our readers.

### A New Witte Engine Catalog

Catalog No. 46 of the Witte Iron Works Co., 3187 Oakland Ave., Kansas City, Mo., contains much of interest to every prospective engine buyer. The pages devoted to "Lower Cost of Engine Power" is of exceptional interest and shows the progress made in the last few years in the production of dependable engines using both gasoline and kerosene for fuel.

Not the least interesting features to the reader are the ones on which are given tables showing the operating cost as compared with the work produced. The prices also are of great interest, as they are exceptionally low, considering the equip-

# 3 Great Prizes for Contractors!

**O**UR Second Great Annual Prize Contest for Contractors, Carpenters and Builders starts March 1st. The prizes in this contest will be awarded according to the amount of orders in dollars and cents, sent in to us between March 1 and December 1, 1915. Last year we gave away an automobile and fifty additional valuable prizes. This year, instead of a single automobile, we are giving three—a Ford Touring Car for first, a Saxon Roadster for second and an Indian Motorcycle for third place in this great contest. And, as last year we are giving

## 50 Other Big PRIZES

All these prizes are worth hustling for. There are hundreds of dollars worth of the finest tools—everything you want.

### The Small Town Man's Chance

to win is good. It is better this year than last—for, this year, there are three big prizes instead of one. Don't forget that it was a contractor in a small town—Polo, Ill.,—who won the automobile last year. Remember, also that this contest is

### Exclusively for Contractors Carpenters and Builders

and that no one else can enter. This contest is for the purpose of keeping old and new customers awake to the big inducements on Building Material offered in our Grand Free Building Material Catalog. Catalog free!

### Send the Coupon for the Rules

The big free Contest Circular gives Rules of the Contest and full information about prizes. Ask for latest edition of our Grand 156-page Catalog of Building Material. Send the coupon for Big Circular today and after these great big beautiful prizes.

**GORDON-VAN TINE CO., 760 Federal St., Davenport, Iowa**

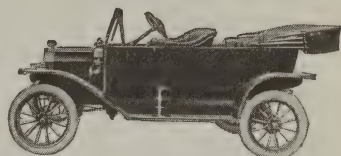
Gentlemen:—Please send the books checked below.

- ☐ 1915 Contractors' Contest Circular
- ☐ Building Material Lumber, Millwork
- ☐ Plan Book (Send 10c for handling and postage) Hardware, Paint, etc.
- ☐ (on this book of 150 proven plans)

Name.....  
Address.....  
Occupation.....

#### 1st PRIZE

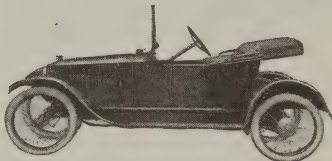
To be given to the contractor who sends us the greatest amount of business during the contest. Is there any reason why you should not win this splendid



**1916 FORD TOURING CAR**

#### 2nd PRIZE

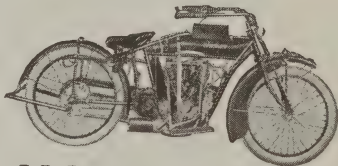
To be given to the contractor who sends us the second largest amount of business during the contest. Go after this



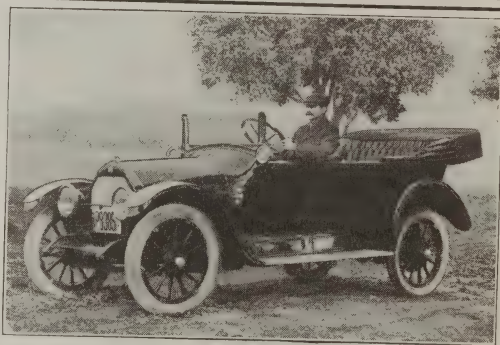
**SAXON ROADSTER**

#### 3rd PRIZE

To be given to the contractor who sends us the third largest amount of business during the contest. Are you to be the rider of this



**INDIAN MOTORCYCLE**



### Last Year's Winner!

Above, we show a photograph of Geo. Drenner of Polo, Ill. in the car which he won for First Prize in our last year's contest. And, in addition, dealing with Gordon-Van Tine on our "direct-to-you" Sales Method he made a saving of almost 33 1-3 per cent on every dollar's worth he bought from us. You can do the same.

### YOU Can Win This Contest!

Get busy. Let our Contest Circular explain to you how we have arranged to give a Prize to every Contestant! Send for the circular.

## Gordon-Van Tine Company

The Largest Building Material Supply House in America. Lumber, Millwork, Hardware, Paints, Roofing, etc., all at "Mill-Direct-to-You" Prices. We ship anywhere. Prompt, Safe Delivery and Satisfaction Guaranteed or Money Back. 10,000 Contractors Deal Regularly with us under this Guarantee.

**Contractors' Dept. 760 Federal St., Davenport, Iowa**

In case of a tie for any of the prizes offered, duplicate prizes will be awarded to tying contestants, or the cash value of the prizes equally divided.

PASTE THIS HOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



ment which comes with them, and the care used throughout their manufacture.

The Witte engine is made in some 36 styles, so that the contractor should have no difficulty in selecting the one which in style and price is exactly suited to his use.

### A Profitable Guess

One of the worst things about contracting is the tendency to guess instead of estimating carefully. It leads to many errors, to the loss of contracts when the guess is high, and to loss of money with the attendant troubles when the guess is too low. There is always, however, in every guessing contest an element of chance which appeals to the average contractor. Consequently when the Archer Iron Works, 2435 W. 34th Place, Chicago, Ill., offered to give as a prize a No. 1 Archer Special Concrete Mixer to the contractor or builder who guessed the nearest to the number of stones contained in the batch hopper there was immediate interest. A large number of contractors and builders made guesses, but it remained for Mr. M. G. Rasmussen of Milwaukee to come the closest to the exact number. His guess was 13,313, while the exact number was 13,299.

While we are inclined to believe that Mr. Rasmussen made a careful estimate rather than a guess, we believe that the contest was one of the leading features of the recent Chicago Cement Show, where the Archer Iron Works had a most complete exhibit of mixers and other machinery for the contractor.

The feature of the No. 1 Archer Special Concrete Mixer consists of having the engine mounted on top of the mixer frame, where it is readily accessible and still entirely out of the way. This mixer has a daily capacity of about 50 cubic yards, which makes it of great value to the contractor doing miscellaneous work.

### A Dustless Home

The modern housekeeper is obliged to keep everlastingly chasing the dust and dirt in order to keep the house presentable. Where formerly house cleaning meant a busy week in the Spring and another in the Fall, now there is cleaning to do every day in the year.

The time spent in cleaning is a great item and everyone looks with favor upon any device or appliance which will reduce the time spent in this way. The Thurman Vacuum Cleaner Co., Dept. F., 11th and Monroe Sts., St. Louis, Mo., appreciate this problem and have devised their vacuum cleaning systems with a view of cutting down both the time spent and the labor required to keep the home, hotel, office or public building clean at all times. In order to be of the greatest assistance to our readers, they have established Department "F" to take care of the requests for information and assistance, which they receive from our readers. This department will prepare a layout showing the proper installation of pipe lines, outlets, etc., as well as advise regarding the proper equipment to install and use. Any request which comes to them is given careful consideration by trained engineers and their advice is therefore to be depended upon. Those of our readers who wish to make their buildings modern in every respect should investigate the Thurman Vacuum System and install the necessary piping, etc.

### Getting Results

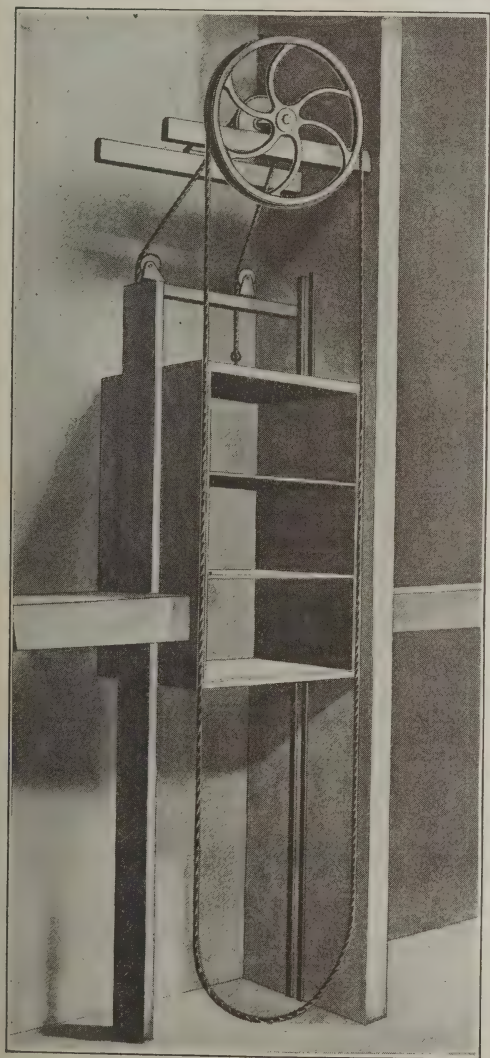
How can a contractor expect to get results, make money, finish his contract on time, or please himself or anyone else unless he takes the fullest advantage of new materials, new machines and new methods of doing work.

A comparatively few years ago it was customary to hoist everything for a building by means of zig-zag runways extending from the basement to the roof. Of course, these took up a lot of room and required a lot of time as well as used a lot of men in order to get the material up fast enough to supply the workmen.

At the present time, however, these methods of getting material are antiquated and obsolete. The machines and appliances by which material is quickly raised cost practically nothing when the saving which they make is considered. The Lansing Motor and Pump Works, Lansing, Mich., have a number of machines for hoisting materials and for furnishing power to derricks and similar appliances. These machines are made in a variety of styles and sizes for single and double drum

# PLAN for CHELSEA Elevators and Dumbwaiters

EXEMPLAR OF QUALITY



A dumbwaiter is always a convenience  
A dumbwaiter is usually a necessity  
Modern homes demand modern dumbwaiters

Provide for **Chelsea Dumbwaiters** in every house or flat building you erect. We have manufactured dumbwaiters for **forty years** and yet here is the most modern dumbwaiter manufactured.

## Double Automatic Brake Dumbwaiter

U. S. Pat. No. 1,129,434. Pat. Feb. 23rd, 1915.

The Automatic Lock is automatic in every way. Both on the **down** motion of the car and also on the **up** motion. The car can be overbalanced by the counterweight and still it retains the Automatic feature. In other words put your load on the car and it stays put until you pull on the hand rope. Release the hand rope and the car and load stops. It can't run away **down** and it can't run away **up**.

**We Guarantee this Machine to be  
as Represented**

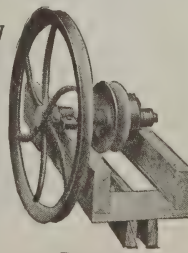
The price is lower than many inferior machines. It has cold rolled steel shafting and anti-friction roller bearings.

It is compact and easy to erect and will pay you a good profit. We will co-operate with building contractors in order to assure the maximum satisfaction to building owners. Write for details of our trade proposition. Plans and full instructions sent with each equipment.

**Write for our catalog today**

It describes thirteen different dumbwaiters and eleven different hand power elevators. Handle the **Chelsea** line and you have the best. Dumbwaiters ready to erect \$22.00 up.

**Chelsea Elevator Co.**  
334 W. 26th St., New York



Patented

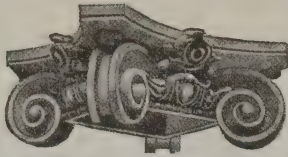
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**Standard and  
Special Designs in  
Interior and Ex-  
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In Plaster, Cement  
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Send us your blue prints for fine resi-  
dence, theater and other public building  
work. Beautiful designs; best work-  
manship. Unusually low prices.

**Architectural Supply Co.**

Harry A. Lang, Prop.

420 High Street Fort Wayne, Indiana

## Contractors Get More Contracts— Builders Save Architect's Big Fees

By using our complete working blue prints and speci-  
fications which are  
guaranteed satisfac-  
tory or money back.

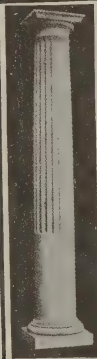


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showing plans and  
elevations of build-  
ings costing from  
\$2,000 to \$4,000.

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as \$3.00 Per Set**

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for our beautiful Pergola Album T 28,  
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Flat Buildings and plan  
an income in your old  
age. Our book gives you  
ideas from two-family  
flats to twelve families,  
and our prices are rea-  
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Both . . . 65c

**H. COOK & COMPANY**  
720 Ashton Bldg., Grand Rapids, Mich.

and driven by belt, gasoline or electric  
motors. The circular which they are send-  
ing out describes a number of these ma-  
chines in detail, giving the size, weight,  
capacity, horsepower, price, etc. The cir-  
cular will be sent to our readers on request  
as will any additional information for  
which they may ask.

## Telephone Communications

While it sounds truly wonderful to  
think of telephoning from New York to  
San Francisco, it is an achievement which  
is not nearly so important as being able  
to talk to the next town or even to the



Making a Call with the Inter-phone

next building. The principle is practically  
the same, but we have far more use of  
a telephone to our neighbors or for a  
means of communications between the sev-  
eral floors of the building or from the  
house to the garage or shop.

The Western Electric Co., therefore, by  
making the Inter-phone available to our  
readers, has done more for them than they  
did when they made the telephone from  
New York to San Francisco possible.  
Briefly described, the Inter-phone consists,  
as will be seen from the cut herewith, of a  
one-piece receiver and transmitter con-  
nected to another similar device. These

Advertisers' Section.

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# JACKS

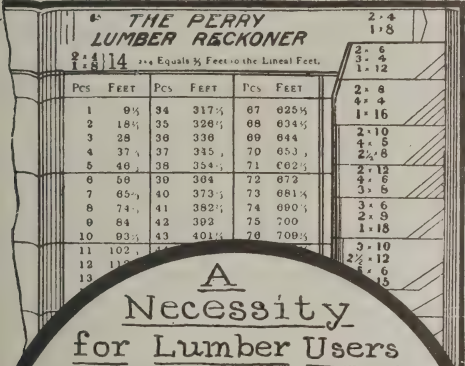
## for Many Building Purposes



### The COLT'S Automobile Jack

This type of jack is more suitable than screw jacks for many purposes. For raising porches, roofs, small buildings, etc., the **Colt's Automobile Jack** is just right. Can be operated quickly and without any lost motion because it is double acting—raises the load with both upward and downward movement of the lever. A new form of U-shaped dog brings leverage and support close to bar. The construction is simple and sturdy. Has a capacity of one ton, yet weighs only 6½ lbs. Price of 6 jacks **\$12.60**. Write for complete catalogue No. 258 on **Colt's Clamps and jacks**.

**Batavia Clamp Co.**  
195 Center St., Batavia, N. Y.



Pcs	FEET	Pcs	FEET	Pcs	FEET
1	9½	34	317½	67	625½
2	18½	35	326½	68	634½
3	28	36	336	69	644
4	37½	37	345½	70	653½
5	48	38	354½	71	662½
6	58	39	364	72	672
7	68½	40	373½	73	681½
8	74½	41	382½	74	690½
9	84	42	392	75	700
10	93½	43	401½	76	709½
11	102½				
12	112				
13					

## A Necessity for Lumber Users

The Perry Lumber Reckoner makes figuring easy. Tells the number of feet in any number of pieces—note cut of sample page at top. Gives *exact* number quicker than you could *guess* at it. Keeps you from making costly mistakes in your estimates; saves time and labor. Covers all the different sizes of lumber, and is so indexed that you can turn to the right page instantly.

Book is bound in cloth; seventh edition; fits the pocket. Thousands in use. Sent to any address, prepaid, for \$1.50. Write for one; money refunded if you ask.

**\$1.50**

**Benj. L Jenks**  
1201 Marshall Bldg.  
Cleveland Ohio

# Save 50%

## on Your Building Material Bill!



LET me send you our Building Material Catalog showing 8000 price bargains on building material and also our Plan Book showing views and floor plans of 50 modern Houses and Bungalows. They will prove you can build, remodel or repair for much less than you expected. We ship everything every where in the way of high grade lumber, flooring, roofing, doors, windows, storm sash, mouldings, porch work, screens, hotbeds, building hardware, paints, wallboard, plumbing, heating and water supply outfits, cement machinery and interior woodwork. All at Wholesale Prices Direct to You. Quality, safe delivery and satisfaction absolutely guaranteed. Building Material Catalog Is Free.



**Material Complete for Houses from \$398.00 up**

**CHICAGO MILLWORK SUPPLY CO.**  
"AMERICA'S GREATEST SASH AND DOOR HOUSE"  
*H. H. Mungie* Pres.

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This Bookcase COLONNADE complete as shown 8 ft. x 8 ft. Yellow Pine

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Oak, Birch or Cypress **\$23.50**

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Chicago, Ill.

Please send me your Free Building Material Catalog. (If the Plan Book is wanted, send 10c for mailing.)

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State \_\_\_\_\_ R. F. D. \_\_\_\_\_

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may be separated any desirable distance, possibly from floor to floor of a building or from the house to the barn, or from the contractor's office to his shop. The use of this device will save many steps and a great deal of time, and can be used not only by the contractor in his own business, but should be installed in every building which he erects.

Department 25, B. L. of the Western Electric Co. of New York City has prepared a booklet of information on interphones especially for our readers. It will be sent to them on request and will show the contractor where he can make good use of it.

### Weber Labor Saving Devices

Nothing has advanced in cost in recent years quite as fast as labor, and in consequence there is a demand for means of utilizing every bit of labor to the very best advantage. This means that not only must a man do more work in less time, but he must do better work than he was formerly expected to do.

The Weber Mfg. Co., 661 71st Ave., West Allis, Wis., in designing the double acting floor scraper, had in mind the saving of both time and labor. The Weber Double Acting Floor Scraper is designed to scrape all the time, both in the forward and backward movement. In this way one-half of the time is saved, while the design of the scraper is such that the highest quality of work is turned out.

The Weber Double Acting Floor Scraper is equipped with a number of automatic devices, one being the Shearing Cut Attachment, which always scrapes to a perfectly smooth finish on new or old floors or on the finest parquet floors. Another device allows the use of a sanding attachment where such a finish is required. A sharpening device which works entirely automatically saves time and labor in sharpening the scraping knives.

It is interesting to note, also, that the knives of the Weber Double Acting Floor Scraper can be set at any desired angle, thus providing for any kind of a wood or floor. The handle, too, is adjustable, so that both the tallest man in the gang or the shortest apprentice can use the scraper and adjust it perfectly to his height.

The Weber Mfg. Co. will be glad to hear from those of our readers who are inter-

ested in floor scrapers and other labor saving devices.

### Wheeler Safety Scaffold Brackets

Any banker will tell you that it is what you save rather than what you spend or earn that makes money for you. Every contractor realizes that it is the materials he saves as well as the labor that becomes profits. No device in recent years has meant more of a saving to the contractor than scaffold brackets. While these can be made at home, the home-made devices are not in any way comparable in quality to those turned out in quantity by the concerns who make a specialty of them.

Department 4 of the American Steel Scaffold Co., Detroit, Mich., is interested at this time in showing our readers the saving which their scaffold brackets will make. It means a saving in lumber, as no braces, struts, or poles are needed. It means a saving in labor because any apprentice can put the scaffold bracket together and put it in place. It means a saving of nails because none whatever are needed, and it means a saving in accidents for there is no chance to put the bracket up any way but securely, and the bracket is made so firm and rigid that there is no possibility of their breaking down under the heaviest load which will be put upon them.

The American Steel Scaffold Co. so firmly believe that their brackets will prove their worth on the first job on which they are used that they are making our readers a special free trial offer. It is certainly worth careful investigation by those of our readers not now familiar with them.

### The Ajax Warm Air Furnace

There are two styles of buildings that need heating apparatus—new buildings and old buildings. The first are rather more apt to have them than the other, although there is no serious reason why satisfactory heating apparatus should not be installed in the old building as well as in the new. The great objection heretofore has been that the height of the cellar did not permit easy installation of many styles of furnaces, but this trouble is entirely overcome in the Ajax Low Construction Warm Air Furnace. We understand

## "TO HUBERIZE IS TO ECONOMIZE"

Buy From "Huber"—More Profit—Better Service

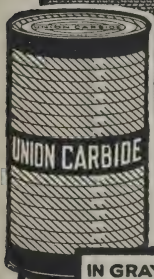
CONTRACTORS AND BUILDERS:

Right buying will keep money in your pocket. When you are ready to buy

**See Our Big 32-Page Building Material Advertisement in the March Number of The National Builder**

There you will find illustrated, described and priced practically everything you need at prices that cannot be duplicated. **Are You a Contractor?**

The Huber Builders Material Company, 39-43 Vine Street, Cincinnati, Ohio



IN GRAY DRUMS  
WITH BLUE BANDS

## HOME MADE ACETYLENE

### Safest Light and Cooking Fuel

Insurance records  
prove it

Insurance records show this—the misuse and abuse of city gas, kerosene and

gasoline caused over 100,000 fires in six months. While the misuse and abuse of acetylene caused but four fires during the same period. And there are over a quarter of a million *Country-Home Acetylene Plants* in use. A mighty fine showing for acetylene.

A hundred feet of acetylene makes more light than a thousand feet of city gas. For this reason acetylene light burners have small openings—so small that not enough gas could escape from an open burner—in a whole day—to do any harm whatever.

Also, acetylene gas is not poisonous to breathe—you would suffer no harm in sleeping under an open unlighted burner. Also, acetylene burns with no odor whatever—but acetylene from an unlighted burner has a strong pungent odor which immediately attracts attention.

Also, acetylene lights are permanently fastened to walls and ceilings—they cannot be tipped over.

Also, the acetylene producing stone, *Union Carbide*, won't burn and can't explode.

For these reasons insurance authorities have pronounced acetylene safer than illuminants it is displacing.

Our advertising literature tells all about the best way to make acetylene for country home use, and how it is used extensively for cooking as well as lighting. Just address—

**Union Carbide Sales Company,** Dept. 27 42nd St. Bldg., New York City, or Peoples Gas Building, Chicago, Ill.

## Stearns' Cypress Doors

We catalogue sixty-two Stearns' Cypress Doors, and will always make up special designs to suit requirements. We log and season the wood on the Florida Gulf Coast, and manufacture it in our big Neponset mills. We sell in any quantity to Eastern buyers and in car load lots *anywhere*; write for booklet "Stearns' Cypress Doors."

### CYPRESS—for All Purposes

We specialize in Cypress, but furnish all kind of millwork in any wood. Investigate our prices and facilities if you're located in the East.

**The A. T. Stearns Lumber Co.**

25 Taylor Street

Neponset, Boston, Mass.

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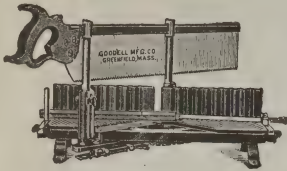


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## GOODELL MITRE BOX

Made of Steel ——— Cannot Break



Send for New Circular E

**GOODELL MFG. CO.,**  
GREENFIELD - - MASSACHUSETTS

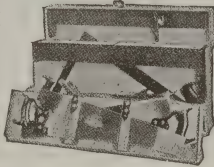
### First in Quality & Improvements

New STEEL BOTTOM  
PLATES with ANGULAR  
SERRATURES to  
prevent the work from  
slipping, and many  
other special features.

## INDESTRUCTO Carpenters' Tool Cases

Stronger than any wooden chest,  
much lighter, holds tools better, much  
easier to carry. Same shape as a suit-  
case when folded and carried like one

Made of 3-ply veneer, covered with  
heavy canvas and painted. Edges and  
corners are bound and reinforced with  
steel. Two brass catches and locks.  
Contains a place for every tool. Two  
sizes—31 in. for 26 in. saws, 33 in.  
for 28 in. saws. Will last a lifetime.  
Write for booklet and prices now.



**WEDELL & BOERS**  
157 Jefferson Avenue, DETROIT, MICH.

## Books for Painters

By A. ASHMUN KELLY

Second Edition of the Expert Painter's Estimator  
and Business Book contains all that can be told  
about reading plans, measuring both from plans  
and from actual work, and estimating correctly.  
Painters need this book. Price, postpaid, \$1.50.

The Expert Calciminer, a text book and manual  
for decorators. All that the interior decorator  
or student needs to know about water colors  
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Hodgson Book Co., 537 So. Dearborn St., Chicago

## C. E. Jennings' Car- penters' Tool Cases

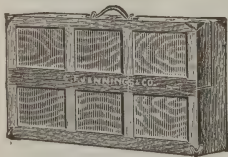


Illustration of Tool  
Case No. 35

Write for circular of our  
Little Wonder Tool  
Kit No. 60

Largest Tool Chest Line  
"Made in America"

**C. E. JENNINGS & CO.**  
Sole Manufacturers 71-73 Murray St., New York

that this furnace can be placed on the floor  
of the cellar where there is only four feet  
ten inches clear space to the ceiling. There  
are few cellars but what have consider-  
ably more than this.

We show a cut of the Ajax Furnace  
which will give one an excellent idea of  
its general construction and appearance.  
Of course, the interior structure cannot  
be clearly indicated in a cut of this char-  
acter, but the Co-operative Foundry Co.,  
P. O. Box 1029, Rochester, N. Y., have a  
more complete circular showing the con-  
struction in great detail. The circular  
also contains an elaborate table showing



The Ajax Low-Construction Hot Air Furnace

the several styles and sizes in which the  
Ajax Furnace is made and gives the sizes  
of the various parts, heights, weights,  
grate surfaces, heating capacity, etc.

The Ajax Warm Air Furnace is car-  
ried in stock by a number of dealers  
throughout the country and the Co-opera-  
tive Foundry Co. will be glad to direct  
any of our readers to a place where they  
can be seen and inspected, or they will  
send circulars or such other information  
as our readers may wish for.

### Builders' Hardware

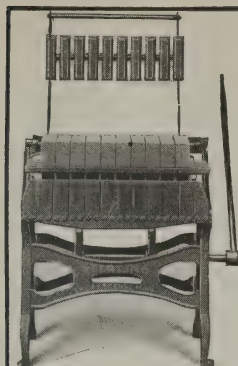
Every contractor wants to have his jobs  
stand out a little better than his competi-  
tors. This can best be done by using ma-  
terials and equipment a little bit better  
than the other fellow. When selecting the

Advertisers' Section.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



## Sterling Cube Batch Mixer

All mixers are good. Some are better than others. Write for our 1915 Catalog, find out why the Sterling is best. Built in three sizes.

*Equipped with the celebrated Novo Engines*

## Sterling Combination Brick and Block Machine

Simple in operation. Handles Wet Mix. Produces Waterproof Brick and Block. **Sold on 10 days' Free Trial.** Get our Prices and Liberal Terms.

**STERLING MACHINERY CO.**  
Box C - La Crescent, Minn.



## Beautiful—Practical —Safe—Profitable

*"BERGER'S"*  
**Classik**  
STEEL CEILINGS

Combine these qualities to such an extent that they are virtually in a class by themselves. Think of the tremendous advantage this gives you.

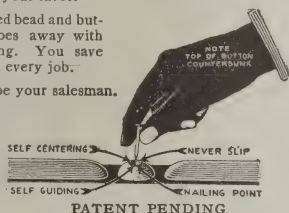
### Berger's "Classik" Steel Ceilings

Are a perfect fire retardant, perfect in construction, sanitary, and—last but not least—can't fall like plaster ceilings which are such a frequent source of injury and death. This is another powerful argument in your favor.

Our improved pressed bead and button construction does away with tamping and calking. You save from 25% to 40% on every job.

Let our new Catalog be your salesman. Its hundreds of illustrations and designs will help you get more business.

Better write or 'phone your nearest Berger Branch today.



### The Berger Mfg. Co., Canton, Ohio

The Largest Sheet Metal Works in the World

Your nearest branch for best service:

New York Boston Philadelphia Chicago  
St. Louis Minneapolis San Francisco

Export Department, 11th Ave. and 22nd St., New York, N. Y.

## Your Flooring Problem Solved

An illustrated book containing thirty-two pages of information of direct interest and practical value to every builder. It should be part of the lumber library of every contractor.

**A copy will be mailed FREE ON REQUEST. You need this book. SEND FOR IT.**

Uncle Sam has investigated the uses and values of many woods. His reports are worthy of your close attention. Speaking of Maple, Beech and Birch Flooring, in Bulletin No. 12 of the Department of Agriculture, he says:

**Maple Floors**—Soon after this the roller skate craze struck the country, and Maple Flooring was instantly in demand. It was the best obtainable material for rink floors....Its good service in the rinks led to its use for other floors....Instances have been cited, apparently well authenticated, where **Maple has given longer service under excessively trying conditions** (stair landings in large stores) **than marble.**

**Beech**—A great deal of Beech is used for flooring, and it ranks after Maple and Oak among hardwoods so employed. **In ordinary floors it wears as well, or nearly as well, as Maple,** and it has the advantage of shrinking and swelling less than most woods.

**Birch**—Sweet Birch is a satisfactory wood for flooring, whether the purpose is ornament or long service or both. **The wood is handsome; it stands well when thoroughly seasoned, and it lasts a long time.** Large quantities of this flooring are made in the lake states and it finds service in houses of the better class in practically all of the eastern and some of the western states.

Hardwood floors in the buildings you construct will not retain their beauty unless they are durable. You have Uncle Sam's word for it that **Maple Flooring lasts longer than Marble.**

**You give your customers the best there is when you put in Maple, Beech or Birch Floors**

**Maple Flooring Manufacturers Association**  
Stock Exchange Building - Chicago, Illinois

## Kanneberg "SERVICE" Means BUSINESS

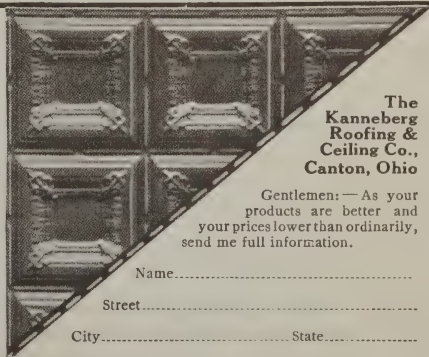
What do you *do* to get *your* share of the metal ceiling and wall installations?

You get some business on the strength of using the highest quality product; you get some if you quote the lowest prices; you get some by offering expert service.

Yet if you offer *all three* you can get *many more* contracts. That's what the *Kanneberg* proposition provides for.

Sign and send the coupon *now*.

**The Kanneberg Roofing & Ceiling Co., Canton, Ohio**



The  
Kanneberg  
Roofing &  
Ceiling Co.,  
Canton, Ohio

Gentlemen:—As your products are better and your prices lower than ordinarily, send me full information.

Name.....

Street.....

City..... State.....

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



hardware, barn door hangers, sliding door fixtures, etc., our readers will make no mistake if they consult the 1915 catalog of the National Mfg. Co., Sterling, Ill. This catalog covers a great variety of subjects, and the various articles are made with the idea of withstanding the heaviest service to which they can possibly be subjected. The catalog is sent to our readers on request, although we understand that practically every first class hardware store carries a more or less complete line of National goods.

### Lumber Publicity

Lumber interests throughout the United States, including timber land owners and manufacturers, wholesalers and retailers of lumber, are contributing in large amounts to a fund that is to be used during the next five years to conduct a national campaign of education and trade extension in the interest of the American lumber industry. It is proposed to expend for the purpose not less than \$50,000 a year.

According to R. S. Kellogg, secretary of the National Lumber Manufacturers' Association, the contributions are coming in at a rate which indicates that the newly created trade extension department of the national organization will be in a position to begin its campaign by April 1. The new department was proposed at a lumbermen's mass meeting in Chicago February 24 and 25.

In preparing for the beginning of operations, the committee on organization is seeking a construction engineer to fill one of the most important positions provided for in connection with the new department. The man who gets the place must be thoroughly competent on all questions affecting lumber construction; he must be able to compile accurate engineering data regarding the use of wood as structural material, and he must be competent to appear before various legislative bodies as the representative of the lumber industry.

In addition to the construction engineer and an executive head for the department, the work will be carried on with the aid of a statistician, who will compile figures on fire losses, insurance rates and other activities, a publicity expert and consulting engineers in various cities to act in

matters relating to the educational and legislative work of the new department.

An important function of the new department will be the dissemination of information on the general subject of lumber throughout the country by means of speakers, bulletins, newspapers and magazine articles, exhibits and general advertising.

### True Grain Wood Finishes in Wall Board by a New Process

The graining of wood has been accomplished for a good many years by the use of rollers and graining tools. The grain has been cut upon the rollers and the rollers and tools applied to the wood in such a way as to produce the grain. The work, while to a certain extent automatic, has been hand work, and the results have depended considerably upon the skill of the operator.

Grain finishes have been applied to wall board in this way with very good results.

The Heppes Company, 4502 Fillmore St., Chicago, manufacturers of Utility Wall Board, have just installed some very extensive machinery for applying grain finishes to their Utility Board. The new process by which these finishes are applied, insures an actual reproduction of the wood. Not stained—but grained is the way the Heppes Company characterize the feature that makes this new-style Utility Board so distinctive.

It comes in four beautiful wood-grains; flat oak, quartered oak, circassian walnut and mahogany. Heretofore to obtain the handsome effects of these expensive, precious woods on the walls of a home it required a fat purse and a willing spender—only the very wealthy could afford to enjoy such exquisite wall effects. But now Utility Board duplicates perfectly the rich, pleasing texture of these expensive, precious woods—yet brings the cost within the reach of practically everyone.

Utility Board—known everywhere for its wear and weatherproof features—is one of the pioneers among wall-boards. The Heppes Company make Utility Board out of layers of fiber board which are lastingly welded together with hot asphalt into one stiff, unbending sheet. Utility Board is a splendid, inexpensive substitute for lath and plaster and for other so-called wall-boards. For Utility Board has in-built



## Special **IMPERVITE** Offer

You have experimented with many water-proofing compounds containing "Stearates" or other soaps. IMPERVITE is not a soap; it is the only compound which is an "Asphaltic Emulsion."

It has been used for many years on the most difficult works. Let us prove that one pound of Impervite is better than two pounds of Soap Compound.

We can send you Official Government Tests and scores of enthusiastic letters from Users—but will this satisfy you?

In order to give you an opportunity to PROVE our claims, we are willing to send you 25 pounds of Impervite for \$2.00 (freight prepaid by us) with the understanding that if it does not prove more efficient than the compound you are now using, you will be under no obligation to pay us. We are willing to let YOU be the judge.

Write today, on your letter head, and shipment will follow at once. WHY NOT GET THE BEST?

**The Standard Paint Co.**  
NEW YORK BOSTON CHICAGO



## Beauty, Permanence, Economy

Make your residence fence beautiful, enduring and economical. You can't do this unless you get the right POSTS.

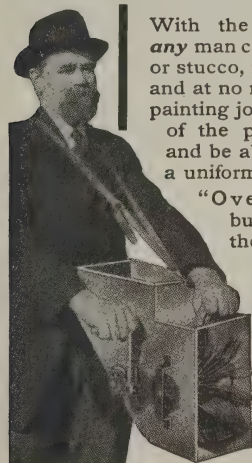
## **CARBO** Unit Yard Posts

mean a handsome, sanitary fence. Carbo Steel Posts are age proof, rot proof, fire proof, vermin proof. Quickly set without concrete. Corners, gates, ends, braces and all are made by simply bolting units together. Within the price of every home owner. Carbo Residence Yard Unit—R. U.—72 in. high, weight 15 pounds, 75 cents each.

Ask your dealer about Carbo Posts or write today for illustrated booklet

**CARBO** STEEL POST COMPANY  
245 Rand McNally Bldg., Chicago, Ill.

## This Stucco Machine Saves Time—Labor—Money



With the SWENSON Machine any man can apply cement plaster or stucco, far better than by hand, and at no more cost than a good painting job. You can apply any of the popular stucco finishes, and be absolutely sure of getting a uniform coat.

"Overcoating" old frame buildings with stucco is the kind of remodeling work that pays big; the SWENSON Machine helps you get contracts—because you can bid lower, make more profit, and give the owner a better job.

### Special Offer

A special discount will be made to readers who mention that they saw this in The National Builder. Write for literature and special terms.

**Automatic Stucco Machine Company**  
51 East 42nd Street New York City, N. Y.



## Wheeler Safety Scaffold Brackets

In Position

Fold Compactly

Save Lumber—Save Labor—Save Nails—Save Accidents

Pay for themselves on two jobs. Last a lifetime. Lock automatically. Are rigid and firm when in place. Scaffold cannot swing. Men cannot be careless putting them up. Write for our **Free Trial Offer**. American Steel Scaffold Co., Dept. 4, Detroit, Michigan

## DE LUXE HEAVY SERVICE



## A Business Bicycle

Especially designed and built to meet the requirements of hard daily service; equipped with strong and durable luggage carrier, folding stand, heavy mud guards and tires.

A strictly high grade, light running machine, for the man who wants a bicycle to ride day after day, with the least possible amount of care and attention.

This is one of a complete line of bicycles to meet every requirement of man, woman or child. If the local dealer does not carry the De Luxe line, write us for catalog. A postal will get it.

**Excelsior Cycle Co., 170-172 N. Sangamon St., Chicago**

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



## Galvanized Iron Cut Nails

For shingles, slating, boat and wharf building, fencing, sheathing and all exterior work use



### Anchor Brand Iron Cut Galvanized Nails

as they will outlast the best of wood under all climatic and weather conditions.

Write for Prices

E. & G. Brooke Iron Co., Birdsboro, Pa.



Sent for \$1.<sup>00</sup>

and Your Dealer's Name

That's a special offer on a special hammer. The "Vandor" Vanadium Nail Hammer is guaranteed to last a lifetime—will be exchanged for a new one at any time if it proves defective.

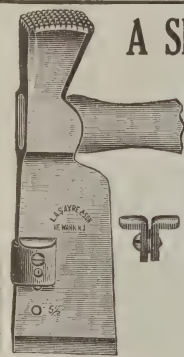
Perfect balance, positive bite. Makes work easy. Will draw anything from a headless brad to a spike. Four sizes to choose from: No. 21½ Standard, 16 oz. No. 22 General Purpose, 13 oz. No. 22½ Finishing, 10 oz. No. 721½ Ripping, 16 oz.

Any one sent for \$1.00 and your dealer's name; don't delay your order—satisfaction is GUARANTEED.

VAN DOREN MFG. CO., Inc.

(Vandor Dept.)

227 W. Erie Street, Chicago, Ill.



## A SHINGLING HATCHET

WITH POSITIVE GAUGE

Carpenters and Builders—Here is a hatchet you can do some fast shingling with—No. 144 (oval head, 169 points.) Gauge is positive—cannot slip. Clamps on with screw; gauge is readily changed. This hatchet is also made with flat head No. 44, 81 points, milled. Price of either, \$1.75 postpaid. We make a complete line, and the best, of Lathing Hatchets, from 64 to 225 points. Prices \$1.40 to \$1.75. You get full money value in a Sayre Shingling or Lathing Hatchet. You can be positive of that. At your dealers or sent direct.

L. A. SAYRE & SON

340 Mulberry St., Newark, N. J.

PEARSON'S  
AUTOMATIC

## SHINGLE NAILER

Pays for Itself on the First Job

Do your nailing faster and on any pitch of roof. Wear mittens or gloves. Great for use on stained shingle jobs.

\$5

Prepaid



Made in two sizes—BLUE for 3d common No. 14 gauge wire nails. RED for 3d galvanized No. 13 gauge 1½ in. wire nails. Get a nailer direct from us.

Money refunded if not as represented  
PEARSON MFG. CO.  
Robbinsdale, Minnesota

qualities of durability that assure it permanence of good looks and the fact that it nails direct to studding and joists or right over old plaster or ceiling without removing the plaster or ceiling from the walls is another convenient advantage in favor of Utility Board.

That this new grained board is Utility Board is assurance of its lasting qualities.

It is not like experimenting with something new and untried. This product has the Heppes Company backing behind it.

### Makes Better Carpenters

A short course of instruction covering Geometry, Projections, Architectural Drawing, Carpentry, Joinery, Stair Building, Roofing, Mechanics of Carpentry, Arithmetic, Formulas, Mensuration, has just been prepared by the International Correspondence Schools.

This course is of particular interest to carpenters and apprentices who wish to increase their knowledge of the theory of their craft and to have a firm foundation for advancement in position and wages. This course can be taken up by anyone at any time and carried on while they are working every day thus supplementing practical work with the theory which should properly accompany it. Those of our readers who wish to know more of this course should write to the International Correspondence Schools, Box 1332 J, Scranton, Pa., for more complete information.

### A Leakless Skylight

One of our readers recently wrote to the Willis Mfg. Co., Galesburg, Ill., asking if they could furnish a skylight which would not leak. This touched a spot with the Willis Mfg. Co. in which they were particularly sensitive as they supposed that everyone understood that no Willis Skylight would leak. They have in their files a great many letters from customers on the subject and this is one of them:

"Willis Manufacturing Co., Galesburg, Ill.

"Dear Gentlemen: I think to do an act of justice manifesting, that the skylights that I have bought you in different occasions, have given me complete satisfaction. In my own home I have four of those skylights and have not leaked neither with the tremendous flood which visited Monterey

Advertisers' Section

PASTE THIS DOME  
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ON LETTERS YOU  
TISERS. IT HELPS.

# Asbestos "Century" Shingles



Residence  
San Antonio, Texas



Hotel  
Sulphur Springs, Ark.



Bungalow  
San Juan, Porto Rico

## The Artificial Roofing Slate that Solved a Problem Centuries Old

AS EARLY as the Eighth Century Builders and Architects objected to the use of wooden roofs as *over-lieable to fire*. This objection brought about two remarkable changes in the History of Building. The first was the introduction of the fire-proof arch and the second was the search for an absolutely fire-proof, light-weight roofing material.

It has taken centuries to solve this latter problem, and its final solution is the Asbestos "Century" Shingle, made by the patented "Century" Process.

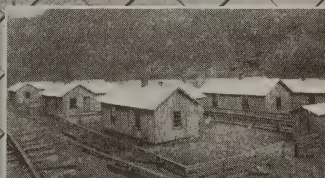
Property owners everywhere have seen these Shingles in use on all classes of buildings. They are asking questions about them and seeking all the information they can obtain.

You and your clients will find the way these Shingles stand up year after year without painting or repairing a revelation of value and service.

There are in your community prospective builders, who will ask about Asbestos "Century" Shingles. Are *you* in position to supply them with the facts about these Shingles? If not, write us without delay for the information, terms and trade prices.

**Keasbey & Mattison Co., Factors**  
Dept. H, Ambler, Penna.

Branch Offices in the Principal Cities of the United States



Mining Camp  
Red Ash, W. Va.



Stable  
New Port, R.I.



School  
Charleston, Ill.



Industrial Plant  
Newark, N. J.

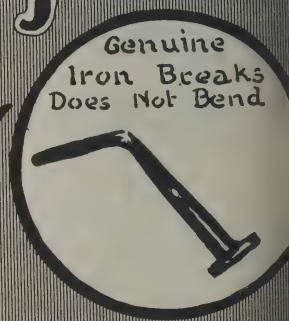
PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



# Will the Shingle Prove Up



## If Not, You Should Use “ZINC-CLADS”

The safest shingle nails on the market—because the base is genuine old-fashioned iron, like the stuff they made those good shingle nails from in grandfather's day; and also because the pure Zinc covering is applied by the Hot Dip Process, same as specified by the Government to protect exposed marine fittings from the ravages of rust.

“Zinc-Clads” are not like ordinary nails—even outside of the high-class materials they are made of—because they have large, flat heads, slender shanks, rounded points. Every nail a *perfect* nail, as clean as a hound's tooth. Made up to standard of quality and usefulness—not down to a low price.

### W. H. Maze Company

Dept N, Peru, Illinois

*We are sole manufacturers of the celebrated Zinc City (Pure Zinc) Shingle Nails and other products*

# Nails You're Using Like This?



## Ask Your Lumber Dealer

He is the logical man to furnish Zinc-Clads, even though he handles nothing else of this kind, because he cannot stand behind his wood shingles as a permanent roofing unless he is sure they will be laid with Rustless Nails.

Zinc-Clad Shingle Nails are packed only in modern, sanitary five-pound cartons, and sold by dealers.

**Price 8c per pound**

### SIZES:

- 3d --  $1\frac{1}{4}$  inch long, 250 nails to pound
- 3½d --  $1\frac{3}{8}$  inch long, 225 nails to pound
- 4d --  $1\frac{1}{2}$  inch long, 200 nails to pound

## W. H. Maze Company

Dept. N, Peru, Illinois

*We are Specialists in Rustless Shingle Nails--Located in the Zinc Market Place of America--In business over sixty years*



in last August, which flood destroyed many properties and there was not a roof which did not leak.

"Yours very truly,  
"JOSE A. MUGUERZA."

Our readers will therefore know to whom to write when they wish skylights of this character.

### The Stanley Bench Bracket

There are so many places where the carpenter can use the Stanley Bench Bracket shown herewith that it would be useless to try to more than indicate some of its advantages. As seen from the cut, it may be used for holding short lengths for sawing, mitering or dove-tailing, for use with a bench vise, for holding doors or windows firmly in place while they are being planed to size, or while locks or butts are being fitted. For long boards two or more can be used to advantage.

This Stanley device can probably be found in the stock of any first class dealer, but those who have difficulty in finding it should write to the Stanley Rule &

he saves big money. This is the principal reason why machinery such as concrete mixers, hoists, etc., are proving so valuable to the contractor.

The Chicago Builders Specialty Co., 465



The "Little Devil" Mixer on the Job

Old Colony Bldg., Chicago, Ill., in their "Little Devil" Concrete Mixer have tried to reduce the labor required to the minimum as compared with the output. This mixer is self contained from the loading platform to the discharge hopper. It can

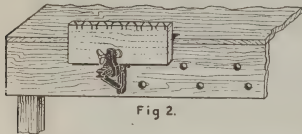


Fig. 2.

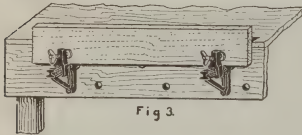


Fig. 3.

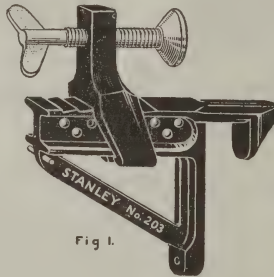


Fig. 1.

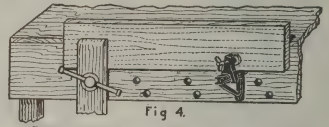


Fig. 4.

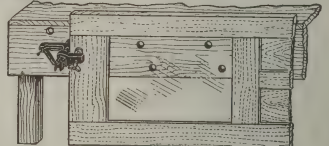


Fig. 5.

The Stanley Bench Bracket in Use

Level Co., New Britain, Conn., for their complete catalog, as well as the special folder which describes this bracket.

### Efficient Concrete Mixing

There is no universal standard by which contractors can estimate work. A ton of concrete occupies about  $\frac{1}{2}$  a yard and costs only a few dollars while the same amount of hardware would cover a large building and cost thousands of dollars.

But there is one thing certain when bulky and heavy material like concrete is used every facility must be provided for rapid and economical handling. Every time the contractor saves a handling by man power

be charged in wheelbarrow loads and this charged into wheelbarrow or chutes as required.

The Chicago Builders Specialty have a circular of this mixer which shows it in detail as well as numerous illustrations of the mixer in use. Our readers will be interested in seeing the photographic reproductions of the busy scenes where the mixer is the center of attraction.

### What Will Scaffold Brackets Save?

The old-fashioned wooden staging and scaffolding is a thing of the past with up-to-date contractors. When one figures the cost, it is apparent that modern scaffold

# The Only Tapered Asphalt Shingle

## Mr. Blue Writes

J. D. Blue, Jr., of the J. D. Blue, Jr., Co., Cedar Rapids, Iowa, writes:

"I am *very well* pleased with the appearance and watertightness of my roof. I experienced a little difficulty in getting my contractor to use Winthrop Shingles, he having always handled the wooden shingles, but since the roof is laid he seems *equally proud of the job*, as I am myself.

"I found the cost practically the same as a dipped shingle, and am satisfied that the wearing quality and appearance are fully 100% better than the best shingle roof. Nothing has brought out more complimentary comments than my asphalt shingle roof."



Winthrop Tapered Asphalt Shingles Used on This New Home in St. Paul, Minn.

## Winthrop Tapered Asphalt Shingles *Shaped Like Wood — Easy to Lay*

Winthrop Tapered Asphalt Shingles Used on This New Home in Des Moines, Iowa



These tough, yet pliable fireproof and weatherproof shingles are made of solid asphalt, into the exposed surface of which fine chipped slate is rolled under heavy pressure. They are extremely durable, easy to lay, light as wood and low in cost. Besides, they lay just like wooden shingles, being **thin at one end** and thick at the other — the **only tapered** asphalt shingle made. Laid with ordinary shingle nails.

### Red, Gray-Green and Slate-Black

We can refer you to Winthrop Roofs in almost every city in America. Before planning your next job, ask for samples, prices, etc.

## The Beckman-Dawson Company ASPHALT SHINGLES

Factory: Argo, Ill.

1415 Association Bldg., Chicago, Ill.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



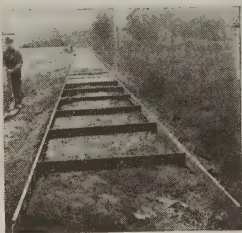
No Contract too Large  
for Capacity of

## THE NORTHWESTERN TERRA COTTA CO.

Nor too Small to Receive  
Proper Attention

Office and Works:  
2525 CLYBOURN AVE., CHICAGO, ILL.

### If You Want Convincing Proof That Hotchkiss Lock Metal Forms



for Sidewalks and  
Curbs

are a profitable investment, write  
for our free demonstration pro-  
position.

You can get into the concrete  
curb building business in your  
city and make good profits; you  
can lay your own sidewalks eco-  
nomically.

Let us tell you about these forms  
and others—look into this now!

**HOTCHKISS LOCK METAL FORM CO.**  
19 Jarvis Street - Binghamton, N. Y.



Miller's Bungalow Plans

are used exclusively in our book, "Bungalows and Other  
Things," which contains photographs and floor plans of many  
artistic homes that can be built for \$1,500.00 up. Get this book,  
it is the best of its kind on the market. Pick out the house you  
want and we will furnish the plans and specifications for \$5.00 to  
\$15.00. The book is receiving high praise from contractors and  
builders. Price \$1.00

Burd F. Miller Co. 25 Brandeis, Omaha, Nebr.

THE ROCK OF AGES CLEFT FOR YOU

RED GREEN  
**SHELDON'S**  
PURPLE BLACK  
**SLATES**

THE ROOF FOR AGES ALWAYS NEW

Artificial substitutes bring endless expense  
for upkeep. Post a postal and get posted.

F. C. Sheldon Slate Co., Granville, N. Y.

brackets are far more economical to use. In the first place, the staging requires \$25 or \$30 worth of lumber, besides taking a day or two to erect, and an equally long time to remove, as well as being more or less in the way while in use. With folding scaffold brackets the time of erection is cut down to a small fraction, while there is a great saving in material, as the brackets can be used over and over again and take up very little room when not in use. The Folding Scaffold Bracket Co., 60 Lafayette Ave., Detroit, Mich., makes a folding bracket which has been used with great satisfaction for a number of years. It is so made that it can be set up or taken down in a moment, and will sustain a load ten times that which it is ever likely to have upon it. Those of our readers who are not familiar with the folding bracket should obtain full particulars as well as prices from the above company.

### Shades for the Windows

Why is it that the contractor is satisfied to leave the building just as soon as he can get the four walls up, the roof on, plastering and painting finished? There are several trades come after he leaves and before the owner moves in. One man measures all the windows for shades. These shades being almost absolutely necessary should be put in by the contractor.

S. A. Maxwell & Co., 3636 Iron St., Chicago, Ill., have a plan of co-operation with the contractor by which the owner secures the highest grade of shades accurately fitted to each window. The shades made by S. A. Maxwell & Co., are in several styles and sizes as well as in a great variety of colors. In quality they are far superior to those ordinarily carried in stock by even the better class of dealers, being made especially for each window opening, there is a finish about them impossible to obtain with ordinary materials.

It would seem to be wise for our readers to investigate the proposition of S. A. Maxwell & Co.

### Light Weight Engines for Shop and Building Work

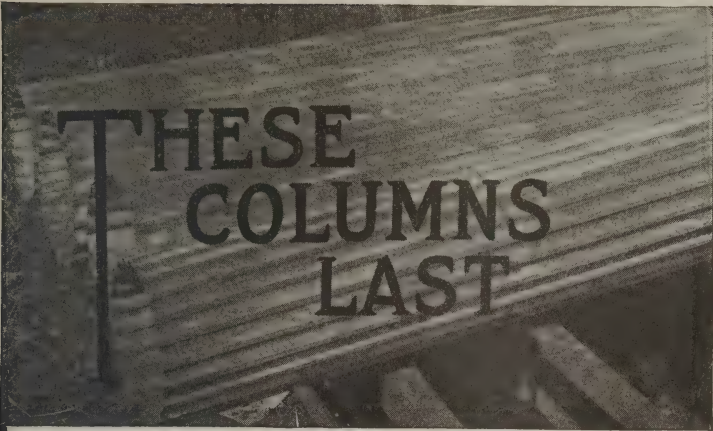
Contractors and builders who use engine power will be interested in the new book recently printed by the Cushman Motor Works, 913 N. 21st St., Lincoln, Neb. This

Advertisers' Section.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



SIX years ago these columns were made wrong size; ever since they have lain as shown here, open and exposed to the weather with no protection save the coat of primer placed on the metal before shipping.

**UNION METAL COLUMNS**  
"THE ONES THAT LAST A LIFETIME"

Stood this test without rusting, peeling or deteriorating in any way. Wood columns would have split and rotted to pieces but the open hearth steel with its coating of spelter cannot split, check, rot, warp or open at the joints.


When placed in position in a building and protected by a coat of paint these columns will last as long as the building itself. Union Metal Columns have entasis and stopped flutes. They are made in all sizes and in ten designs, true to the classical orders of architecture.

*A Handsome Forty-Page Book of Installations on Request*

**The Union Metal Mfg. Co. - - - - Canton, Ohio**

# CORTRIGHT

## METAL SHINGLES



**T**WO great questions with the prospective buyer of roofing are "how long will this roofing last," and "what will be the cost for repairs?"

Frankly we don't know just how long Cortright Metal Shingles will last. A great many Cortright roofs put on twenty-seven years ago are good as ever today and have cost nothing for repairs or replacements.

We have a great number of letters from contractors and builders telling of the satisfaction Cortright Metal Shingles have given customers during the ten, fifteen, eighteen or twenty years they have been handling them.

Our illustrated catalog and special proposition to contractors and builders should be in your hands.

**Write Now**

**Cortright Metal Roofing Co.**  
Philadelphia and Chicago

### NEVER NEED REPAIRS

## A House Top That Tops Them All



For artistic appearance and defiance of the elements there is no roofing that will equal *MULLINS' Metal Tile Roofing*.

It is built-in insurance against fire, rain, wind, acid fumes and lightning. It is guaranteed, when put on according to directions, to remain in perfect condition for years. Expansion and contraction, which are the main faults with most metal tile roofings, have been overcome in

## Mullins' Metal Tile Roofing

Architects, Builders, Cornice Makers and Roofers will find our prices the lowest possible consistent with good work and prompt shipments. Special discounts to the Trade.

**Write for Catalog**

**THE W. H. MULLINS CO.**  
210 Franklin St., Salem, Ohio, U. S. A.



## Agents Wanted

**Reliable Carpenters, Builders and  
Material Men**

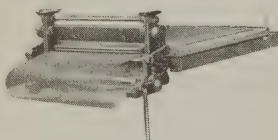
### To Make Big Money

taking orders for our made-to-measure "Fly Screens and Screen Doors" for dwellings and porches.

**Write for Our Agency Proposition**

Standard Shoulder Strip Method makes the wire drum tight and firm; cannot sag or pull away.

**Standard Screen Co., 1848-58 Hastings St., Chicago**



### Miller's Screen Wire Stretcher

Will help you make screen doors and windows in half the time. Insures a snug-fitting, evenly stretched screen without sag. Saves its own cost. Operated by foot and holds wire tight until tacked.

**Write Now For Circular and Price**

on this and on my Sliding Arbor Cut-Off Saw, Clamping Bench and Laying Out Table, Moulding Mitre Cutter, etc.

**A. N. MILLER, 750 38th St., Milwaukee, Wis.**  
Manufacturer of Special Sash and Screen Making Machinery

## \$1.25 Profit

**Every time you make a window wind-tight**

Pullman All-Metal Weather Strips keep out wind, dust and cold. *Positively!* Save fuel; prevent sash rattling; make rooms more livable. Pay you a profit of \$1.25 for every window you equip. Every house needs them.

We'll make you an agency offer — one where profits are *sure and easy* — if you'll write us *at once*.

**Pullman Metal Weather Strip Co.**  
22 York Place York, Pennsylvania

## Make Screen-Hanging Easier



and at the same time add to *your own profits* and to your customer's everlasting satisfaction by using

### Kees-Gossett Hinges

The best way to hang full-length screens — the kind that keep out ALL of the flies ALL of the time. Screens swing out for window-washing and ventilation — lock securely opened or closed. Easily removed or hung.

**Write for samples today**

**ED. KEES MFG. CO. BEATRICE, NEB.**  
Box 811

firm builds engines of very light weight, but at the same time of exceedingly steady and quiet power. They have carried this principle to a greater extent than any other American firm, although some European builders have cut down their weights almost as much as Cushman.

The Cushman 4 H. P. engine weighs 190 lbs.; the 2-cylinder 8 H. P. engine weighs only 320 lbs., and the 2-cylinder 20 H. P. weighs only 1,200 lbs.

These engines are especially valuable where different kinds of work are required of an engine, as they are so easy to move around. The Cushman firm will send a copy of their book to anyone interested.

### A New, Extra Heavy Roll Roofing

The Heppes Company, 1012 S. Kilbourne Ave., Chicago, are now putting out a new roll roofing, which in quality and thickness is the equal of their well-known Giant Flex-A-Tile Shingles. This roofing is in effect the Giant Flex-a-Tile Shingle in roofing form, but made in rolls.

It gets its super-strength, its lastingly durable quality from the heavy wool-felt and the pure oil-free asphalt, both of which ingredients, as in Giant Flex-a-Tile Asphalt Shingles, are unsparingly used in this new roll roofing.

The Heppes Company call this new roll roofing "Flex-a-Tile Dreadnought" to distinguish it from their other Flex-a-Tile products. The name Flex-a-Tile, in fact, identifies all the Heppes Top Quality roofing products. Besides the standard weight and the Giant Flex-a-Tile Asphalt Shingles you will also find Flex-a-Tile identifying a diamond point and a slotted strip shingle.

The Heppes Company arrowhead, which is called by them the quality mark for the best building material produced, also designates their Utility Board as well as their silica-surfaced, Rubbertex roll roofings and is found on each can or keg of their No-Tar Asphalt Paints. It is a mark that is recognized everywhere in the building industry.

Another product which reflects the genuine Heppes quality is their No-Tar Asphalt Paint. It is a well-known fact among building men that a pure, no-tar asphalt paint is the best possible protection for damp-proofing of foundations and for all exposed structural work from roofings to rivets. The

Advertisers' Section.

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**This Box  
FREE**

## "Bull Dog" Sash Cord Fasteners

You can't afford to tie knots in sash cords and sash chains! — you waste cord, time and labor.

Economize, and get better results, by using "Bull Dogs"—the **steel grip** fasteners that cannot let go.

Use them for sash cord, chains, sash and weights. No tools needed — just your fingers.

We will send the box of fasteners shown above, without cost or obligation, to any carpenter or builder upon request. Write for it today—and be convinced!



Trade Mark  
Reg. U.S. Pat. Off.

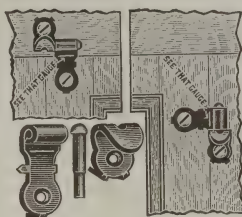
**The Allen-  
Sponsel Co.**  
197 Pearl Street  
Hartford, Conn.



Pat. Aug. 11-14

## Watrous Screen Hinge

Used Either as a Hanger or Hinge



Only four screws to set instead of twelve. Sagging impossible. Easy to put on or remove. They are equipped with gauge mark which makes mistakes in setting impossible. No mortise needed—this is only one of its big advantages.

Allows screens to be swung out. **Only side hanger made.**

Just the thing housewives have been looking for. Here's an article they will thank you for suggesting.

Full information on this as well as our other screen hardware and wrought Steel Butts sent free. Write for it today.

*They are time savers and therefore  
money-makers for you*

**Watrous-Acme Mfg. Co., Des Moines, Ia.**

Chicago Sales Office: 180 North Dearborn Street

USE

## Pullman Unit Sash Balances



instead of the old fashioned cords and weights.

UNIT Balances are noiseless, present a fine appearance and last almost indefinitely. Box frames are dispensed with, permitting the use of narrow mullions, and reducing the cost of the woodwork.

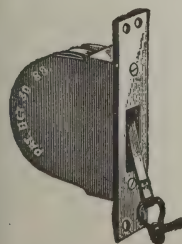
### Uniform Size Face Plates

Makes the cutting of mortises just as easy as for sash pulleys.

UNIT Balances can be installed with less labor than cords and weights, and usually at an actual saving in cost, at the same time perfect working windows are assured. Catalog with blue prints sent on request.

Pullman Mfg. Co., 12 Industrial St., Rochester, N. Y.

## Caldwell Sash Balance



Does away with weight and cords and **vastly** more durable. Makes sashes work perfectly. Permits greater window space in new work, as box frames are not necessary. May be applied to old windows without altering sashes or frames.

Write for Circular to

**Caldwell Mfg. Company**  
2 Jones St., Rochester, N. Y.

PAT. 2-25-13



**WE** guarantee all sash weights shipped by us to have perfect eye, clear number and weigh true to mark. Clean castings without lumps.

Careful attention and prompt shipment of special weights.

Price and list of stock sizes upon request.

**Ream Foundry Co.**  
Lebanon, Pa.

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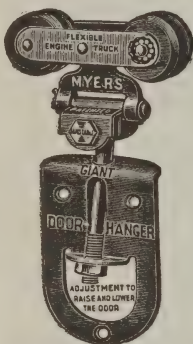
SUN-RED  
SELVAGE

## Rust-Proof Alumina

is a 10-coat electro-galvanized Window Screen Cloth—electrically applied after weaving. It is guaranteed to last from 2 to 5 times as long as any other Galvanized Cloth on the market.

We furnish Screen Makers and Mill people with free printed Folders for their trade. Write for free samples.

**Reynolds Wire Co. - Dixon, Illinois**



## MYERS GIANT

and New-Way  
Adjustable Tendem  
Door Hangers

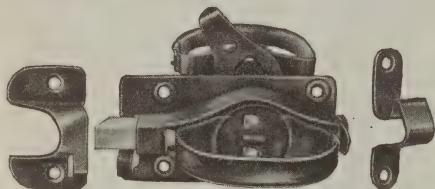
PATENTED

For Tubular Girder Track

Are adjustable up or down, and in or out. Trolley Wheels are heavy turned steel, revolving on steel roller bearings, and run inside the tubular girder track. Not affected by rain, sleet or ice. Write for descriptive circulars and prices.

**F. E. MYERS & BRO.**  
ASHLAND, OHIO

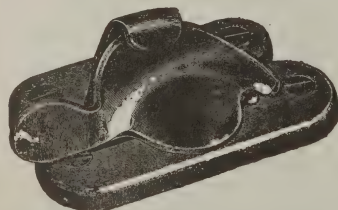
## Whitcomb Steel Barn Door Latch



Over 13,000 Dozen Sold Last Year

A strong, durable, convenient latch, adjustable to doors of any thickness; will not catch harness. Two large handles permit opening of doors from either side. Each latch provided with two catches to hold door open and closed. Also arranged for use of a padlock.

**Albany Hardware Mfg. Co., Albany, Wis.**



Antique  
Copper  
Finish  
Sash Lock  
No. 5493

**40c**  
Per Doz.

Rehm's New Catalog is ready for you. Write now; it's free. Shows fine big line of builders' hardware, tools, etc.

We do not sell to contractors in Cook County, Illinois.

**REHM HARDWARE CO.**  
1503 Blue Island Ave. Chicago, Illinois

Heppes Company realized this fact and, requiring a paint that would serve this purpose in their own business, they tried to procure one in the open market. None of these asphalt paints obtainable filled their requirements, so they decided to make their own asphalt paint.

Being made by roofing men in a roofing factory, Heppes Pure Asphalt No-Tar Paint really is pure and really does serve the purpose required of it. It spreads thin—sets quickly and dries slowly; it is a splendid covering for bridges, submarine work of all kinds, for dipping castings, for every purpose where a paint of lasting serviceable quality is required.

We advise readers to get in touch with the Heppes Company and get their samples which are sent free together with full information about their different products. The factory of the Heppes Company is said to be one of the largest and best equipped establishments of its kind in the country.

## Building Construction Shows Improvement.

Building construction throughout the United States shows a material improvement over the recent past. This is in keeping with a generally improved condition as reflected in bank clearings and other factors used as a foundation upon which to base conclusions. Permits were taken out in one hundred and eight principal cities of the country, in February, according to official reports to Construction News, for the construction of 14,890 buildings, involving a total estimated cost of \$42,434,232, as against 13,548 buildings involving \$47,632,750 as compared with the corresponding month a year ago, an increase of 1,342 buildings and a decrease of \$5,198,518, or 11 per cent in cost. This is a most satisfactory showing considering that in January there was a loss of 26 per cent and in December 43 per cent. It will be seen, that there is not much to complain of in the February figures; a decrease of 11 per cent while the volume of construction was greater, the latter more than offsetting the apparent falling off in cost because of the larger area of activity. A comparison of the seven months since the beginning of the war, showing a loss for every month varying from 26 per cent in August last down

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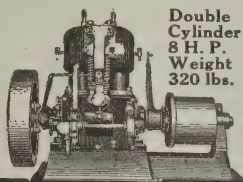
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## Cushman Light Weight Engines

**R**UN steadily, quietly, and without trouble. Can be used in many ways heavy engines cannot. Weigh about one-fourth of other engines, yet more steady and reliable because of Throttle Governor and Perfect Balance. 4 H. P. 190 lbs.; 8 H. P. 320 lbs.; 20 H. P. 1200 lbs. Easy to move around. Schebler Carburetor. Friction Clutch Pulley.

Contractors and Builders requiring engine power will do well to investigate these light-weight, steady, high-powered 4-cycle engines. State power you need.

**Cushman Motor Works**  
913 N. 16th St., Lincoln, Neb.



**Double  
Cylinder  
8 H. P.  
Weight  
320 lbs.**

## AGENTS \$45 TO \$80 A WEEK



**NEW INVENTION** Just out. Nothing like it. **FOLDING BATH TUB.** Give to every home a complete bath room in any part of the house—without expense. Biggest, quickest, surest money maker of the century for agents. Territory being rapidly assigned. Send your application today.  
**100% PROFIT** We back you with our capital and experience. We give you complete instructions, assistance and co-operation. No charge for territory. Don't delay. Send your name at once. Write plainly and give name of your county. Complete particulars **FREE.** Write today.

**ROBINSON MFG. CO., 1509 Factories Bldg., Toledo, Ohio**



## Get Into Business For Yourself

You'll never get anywhere as long as you're hammering away for the other fellow. Take the contracts yourself and you will earn more in a day than you can now pound out in a week as a carpenter.

You've got just as good stuff in you as the man you're working for. You can learn as much about the building business as any big contractor knows.

And you won't have to spend 10 or 15 years getting this knowledge. There is a better way—and that is through the clear and practical Building Courses of the International Correspondence Schools.

With your practical experience coupled with one of these Builders' Courses, you can learn more in six months in your *own home* after working hours about drawing plans, making estimates, selecting materials and construction methods than you can pick up in six years by experience alone.

Thousands of carpenters have built big and profitable contracting businesses on the knowledge they gained from the I.C.S. *YOU can do the same.*

Just mark and mail the attached coupon, indicating the course in which you are most interested. And the I.C.S. will send you free of cost a complete description of this course and an interesting booklet, "1,000 Successes in Architecture."

### Mark the Coupon—NOW

#### INTERNATIONAL CORRESPONDENCE SCHOOLS Box 1332F, Scranton, Pa.

Please explain, without further obligation on my part, how I can qualify for the position before which I have marked X.

Architecture  
Architectural Draftsman  
Contracting and Building  
Structural Engineer  
Structural Draftsman  
Concrete Construction  
Law for Contractors  
Estimating Clerk  
Electrical Engineer  
Electric Lighting  
Plumbing & Steam Fitting  
Heating and Ventilation  
Plumbing Inspector

Mechanical Engineer  
Patternmaking  
Civil Engineer  
Surveying and Mapping  
Commercial Illustrating  
Mining Engineer  
Gas Engineer  
Automobile Running  
Bookkeeper  
Stenographer  
Civil Service Exams.  
Advertising Man

Name \_\_\_\_\_

St. and No. \_\_\_\_\_

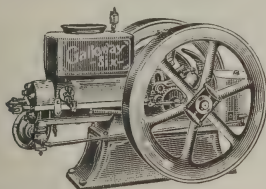
City \_\_\_\_\_ State \_\_\_\_\_

Present Occupation \_\_\_\_\_

## Galloway "Six"

---the 4-in-1 engine

Use it for driving your Saw Rig—your Pump—your Concrete Mixer—your Hoist. Plenty of weight, plenty of strength, plenty of power. A real master piece—in name and operation.



Backed by the Galloway reputation; guaranteed by the Galloway policy. Costs you only \$98.75 because we sell direct from factory to user. Order today—or send for catalog.

The Wm. Galloway Co.,  
2315 Galloway Station  
Waterloo -- Iowa

## Stillwell California BUNGALOW HOMES

Meet the climatic requirements of every locality. Distinctive. Artistic. Comfortable. Inexpensive to build. Easy to sell.

**3 Big Plan Books for \$1 postpaid**

"Representative California Homes" 50—\$1600 to \$6000—50c  
"West Coast Bungalows" 51—\$600 to \$2000—50c  
"Little Bungalows" 51—\$300 to \$1700—25c



Each has photos and full descriptions, plans, costs

**We Sell Books and Blue Prints on a Money-Back Guarantee**

**E. W. STILLWELL & CO., Architects**  
4384 Henne Building Los Angeles, California

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### Introducing the New Sasgen 1 Ton Portable Stiff Legged Derrick

Built Strong and Light of all Crucible Steel Fittings

Peerless Steel Derrick 1800 lbs. Capacity

Write for circular "N"



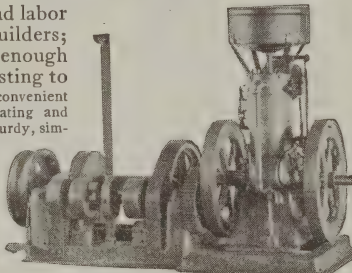
Prices very low and arranged according to length of boom. Satisfaction and prompt shipment guaranteed.

**Sasgen Derrick Co., 2053-57 N. Racine Ave., Chicago**  
Canada Office: 1 Wabash Ave., Toronto

## Ebel Hoisting Outfit

A big time and labor saver for builders; soon saves enough over hand hoisting to pay for itself. A convenient outfit for excavating and wrecking work. Sturdy, simple, big capacity, small price. Write for booklet.

**Lansing Motor and Pump Co.**  
Lansing - Mich.





## CUTTER HEAD

Designed to meet the needs of the carpenter and builder who wants to make his saw table do more work. Any shape knives made to order. Runs like a solid cutter.

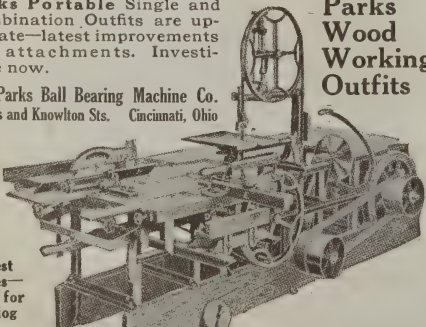
Catalog No. 34 sent on request

**Huthier Bros. Saw Mfg. Co.**  
1105 University Ave., Rochester, N. Y.

Patented December 30, 1913

**Parks Portable Single and Combination Outfits are up-to-date—latest improvements and attachments. Investigate now.**

**The Parks Ball Bearing Machine Co.**  
Fergus and Knowlton Sts. Cincinnati, Ohio



**Parks Wood Working Outfits**

Lowest Prices—Send for Catalog

to 11 per cent in the month just closed, with July of last year, the last month prior to the war showing an increase, and this just prior to the beginning of the war is interesting.

GAINS AND LOSSES, PRACTICALLY SAME CITIES FOR EIGHT MONTHS:

	Per cent
July, 1914, increase.....	15
August, 1914, loss.....	26
September, 1914, loss.....	35
October, 1914, loss.....	20
November, 1914, loss.....	27
December, 1914, loss.....	43
January, 1915, loss.....	26
February, 1915, loss.....	11

Building conditions at the present time reflect in a generous manner the resourcefulness and the recuperative powers of this country. For several months the central west reflected most gratifying conditions; now the improvement extends to all parts of the country, there being some rather remarkable increases in localities which have forged ahead at a remarkable rate or because of actual demand or the increase of construction has been due to some particular event, notably the expositions on the Pacific Coast, many of the cities throughout that section showing material losses over previously corresponding periods.

Cities.	1915		1914	
	No. of Bldgs.	Estimated Cost.	No. of Bldgs.	Estimated Cost.
New York City (Boros, Man. and Bronx) ..	510	\$ 8,557,864	638	\$ 4,047,353
Chicago .....	579	4,701,500	455	5,097,900
Boston .....	230	3,587,000	214	3,586,000
Philadelphia ..	1,260	2,574,930	665	1,794,905
Brooklyn .....	527	1,868,365	671	3,535,465
Cleveland .....	738	1,733,925	581	1,398,010
Detroit .....	402	1,307,215	353	3,020,850
Baltimore .....	221	977,365	244	417,743
Newark .....	158	955,391	121	1,247,933
Washington, D. C. ....	298	890,833	235	884,036
Minneapolis ..	296	811,495	178	498,005
San Francisco ..	457	807,936	449	4,574,281
St. Paul .....	109	797,054	85	371,444
St. Louis .....	500	701,062	415	908,083
Springfield, Mass. ....	91	692,795	47	292,765
New Haven, Conn. ....	80	674,855	38	291,754
Pittsburgh .....	279	608,644	158	2,010,568
Los Angeles ..	538	560,697	829	1,455,730
Cincinnati .....	983	499,645	691	316,515
Atlanta .....	206	471,961	215	335,391
Toledo .....	142	454,607	108	606,400
Milwaukee .....	124	409,056	128	578,496
Seattle .....	697	353,880	769	553,295
Oakland .....	213	328,934	279	429,192
Dallas .....	124	324,185	211	564,220
Portland, Ore. ....	347	311,740	573	605,530
Indianapolis ..	356	307,750	152	292,469
Buffalo .....	206	307,000	172	395,000
Louisville .....	142	283,220	93	163,800
Albany .....	158	277,115	118	200,650
Richmond ....	94	259,184	81	270,567

Advertisers' Section

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**Every Minute  
This Hand  
Moves You  
Save 15  
Seconds**

**Added  
Earning  
Power  
\$4.00  
to  
\$8.00**



# Clip 15 Seconds Off Every Mix

The actual mixing process in a mixer has been perfected to the point where no other improvements can be made—that is, no radical improvements of any kind. The process of mixing cannot be reduced in the matter of time expended—you've got to have a thorough "mix." The only places where time can be gained are in the charging and discharging.

The Northwestern Mixer has a large opening into which the materials can be easily dumped—there are no paddles at the feed end of the drum. This is done away with by reason of the tilted form of the Northwestern drum. Gravity does it.

By reason of the elongated and tapered cone-shaped cylinder the materials are turned fully 50% more times per minute than with either of these features used singly. This insures thoroughness of mix.

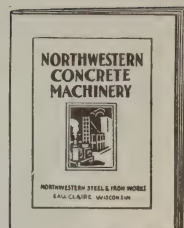
The Northwestern Discharge, with the big scoop in the inside of the drum, and revolving with the drum, picks up and dumps the contents of the mixer in three revolutions, or in from 8 to 10 seconds. This dumping, fast as it is, is controlled by a door and lever which is positive in action and within easy reach of the operator. The wettest grouting mixture will not slop.

There is where the Northwestern Mixer saves you time—at both ends of the mix.

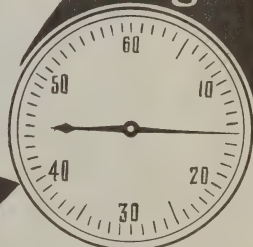
Our big FREE BOOK which tells all about our entire line of concrete machinery of all kinds, will be sent you for your name and address on a postal.

**Northwestern Steel &  
Iron Company**

303 Ball St., Eau Claire, Wis.



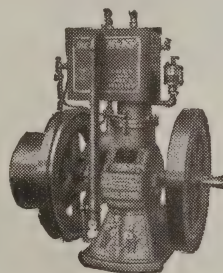
**This  
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Book  
Tells  
You All  
About It  
A Postal  
Brings It**



## WHO PROFITS when the engine goes right MR. CONTRACTOR?

And your mixer or other machinery is turning out its full capacity.

**YOU KNOW VERY WELL** that all the time your engine "goes and goes right," as does the "NEW-WAY" your estimated profit is being maintained, and you are not losing the wages paid men waiting for the engine to be fixed.



You will not be annoyed by comments from idle men as to what ails the engine

**IF YOU SPECIFY and DEMAND** when you buy your mixer that it must be equipped with a "NEW-WAY" direct cooled engine, because it "goes and goes right."

Therefore it is money in your pocket to insist on the machine you buy being equipped with the right power—

**The "New-Way" Engine**

Write for Catalog N

**The "New-Way" Motor Company  
LANSING, MICHIGAN, U.S.A.**

## Winner Mixers

*Are the Kind that Stand  
the Service Test*

Built in five sizes and a dozen models. Prices from \$40.00 up.

Before you buy a concrete mixer we want you to get our catalog and learn how we can save you from \$25.00 to \$100.00.

Write Today

**The Cement Tile Machinery Co.  
511 Rath St., Waterloo, Iowa**

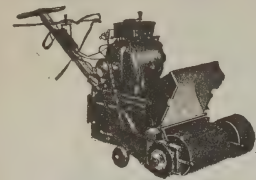
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The **AUTOMATIC BALLBEARING ELECTRIC**  
**Floor Surfacing Machine**



will save you money  
by rapidly finishing  
your new or old floors  
just the way you want  
them. Self-propelling  
—you simply guide.

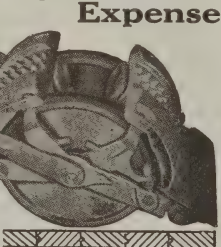
Write today for book-  
let telling all about the ma-  
chine, our *free trial offer* and  
list of users near you.

**WAYVELL CHAPPELL & COMPANY**  
Phone Ravenswood 4143  
Dept. C, 4845 E. Ravenswood Ave., Chicago, Illinois

The **WEBER** Double Acting **Floor Scraper**  
Try It For 5 Days at Our  
Expense

Scrapes 800 sq. ft. of floor  
per day *easy*—1200 feet if  
you "speed 'er up." Saves  
\$5 to \$8 a day over hand  
labor. Operates easily and  
cleanly. Prices \$15 and up.  
Our agency proposition means easy  
money for you; write us about it.

**WEBER MFG. COMPANY**  
661 71st Ave., West Allis, Wis.



**\$15, \$25 and \$35**



Scrape your floors with Fox  
Machines. Scrapes any floor  
with even, uniform cut.  
Six to nineteen knives  
attached. The right scraper  
at the right  
price.  
Write for  
catalogue.

**Fox  
Supply  
Co.**  
Dept. N  
Brooklyn,  
Wis.



**FREE TRIAL**  
**Rapid Floor**  
**Surfer**

Made in  
Several Sizes

**M.L.Schlueter**  
225 W. Illinois St.  
CHICAGO

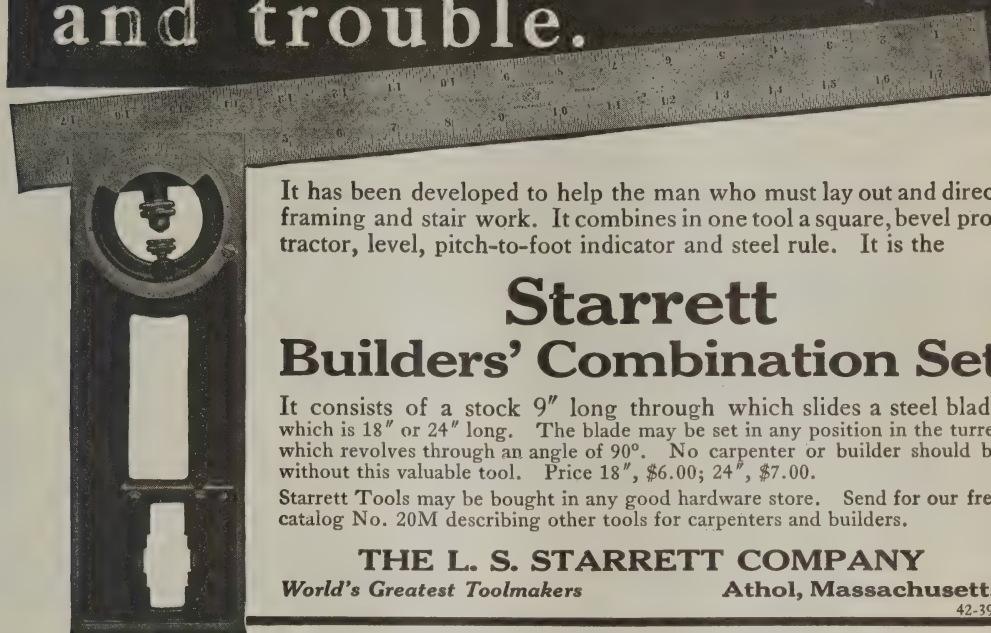
Bridgeport ...	59	237,495	59	154,628
Norfolk, Va. ...	54	172,730	49	96,835
Denver ...	175	165,070	286	206,205
Syracuse ...	77	160,383	62	75,915
Columbus ...	119	153,350	108	225,915
Hartford ...	69	151,600	50	99,165
Salt Lake City ...	92	149,705	52	112,600
Birmingham ...	...	136,710	...	216,455
Cedar Rapids ...	22	133,000	20	145,800
Sacramento ...	103	123,307	103	200,691
Atlantic City ...	...	117,349	...	42,768
San Antonio ...	175	113,595	219	577,950
Akron ...	101	110,260	71	198,530
Erie ...	94	109,168	63	58,150
Grand Rapids ...	89	104,300	47	82,095
Worcester ...	74	104,220	38	104,820
Reading ...	49	102,275	36	95,750
Memphis ...	145	101,735	232	275,455
New Orleans ...	...	97,323	...	204,794
San Diego ...	122	95,990	230	162,098
Berkeley ...	60	93,600	81	100,200
New Bedford ...	55	92,925	41	111,825
Duluth ...	69	89,647	55	156,370
Evansville ...	97	85,435	52	159,256
Omaha ...	39	84,100	65	221,175
Fort Wayne ...	31	80,100	9	103,300
Youngstown ...	46	79,650	36	84,740
Haverhill ...	28	75,400	4	15,800
Savannah ...	38	74,000	43	113,850
Trenton ...	59	71,673	44	77,064
Wilkes-Barre ...	76	70,125	21	36,973
Lawrence ...	25	66,775	5	14,200
Springfield, Ill. ...	19	65,900	15	28,050
Nashville ...	265	65,705	42	79,885
Allentown ...	29	65,685	23	60,300
Des Moines ...	30	65,145	22	126,300
Tampa ...	95	58,055	129	109,820
Paterson ...	64	57,217	47	65,378
Tacoma ...	110	56,751	128	167,722
Brockton ...	27	56,130	25	41,890
Kansas City, Kan. ....	40	55,150	41	43,125
Peoria ...	17	51,750	15	85,600
Troy ...	22	47,445	19	26,966
Syracuse ...	27	42,600	25	64,729
Elizabeth ...	19	40,184	12	23,210
Canton ...	24	39,550	17	37,250
Binghamton ...	100	38,871	34	73,005
Harrisburg ...	18	38,425	12	41,875
Topeka ...	13	37,770	31	47,403
East St. Louis, Ill. ....	23	37,070	26	95,370
Pasadena ...	82	36,531	113	83,035
Sioux City ...	20	36,150	26	28,375
Stockton ...	45	33,900	36	21,936
Chattanooga ...	154	33,110	178	108,925
Lincoln, Neb. ...	19	31,560	25	35,675
Auburn ...	...	30,010	...	750
Waterbury ...	...	30,000	...	63,000
Bayonne ...	13	29,185	7	11,075
New Britain ...	24	28,585	10	5,620
San Jose ...	24	27,418	45	42,278
Passaic ...	18	24,800	10	2,410
Spokane ...	22	21,725	36	24,125
Superior, Wis. ...	25	20,675	15	15,140
St. Joseph, Mo. ...	31	18,751	27	29,715
Niagara Falls ...	6	15,450	17	73,875
Dayton ...	27	14,453	29	49,970
Saginaw ...	17	13,075	19	13,465
Colorado Spgs. ...	20	11,525	25	111,520
Utica ...	12	7,975	14	19,050
Hoboken ...	3	6,690	10	178,084
Butte ...	12	6,125	15	61,700
Pueblo ...	9	5,700	23	45,200
Holyoke ...	5	4,500	5	13,800
West Hoboken ...	9	4,345	4	21,340
Schneectady ...	8	3,825	10	8,680
Woonsocket ...	8	1,725	8	11,000

Totals ...14,890 \$42,434,232 13,548 \$47,632,750

Gratifying increases are shown in New  
York City where there was a gain of 111  
per cent in February over the correspond-  
ing month a year ago; Philadelphia, 43 per  
cent; Boston was on a par with last year;  
Cleveland, a gain of 24 per cent; Minne-

Advertisers' Section.

# This tool saves time and trouble.



It has been developed to help the man who must lay out and direct framing and stair work. It combines in one tool a square, bevel protractor, level, pitch-to-foot indicator and steel rule. It is the

## Starrett Builders' Combination Set

It consists of a stock 9" long through which slides a steel blade which is 18" or 24" long. The blade may be set in any position in the turret which revolves through an angle of 90°. No carpenter or builder should be without this valuable tool. Price 18", \$6.00; 24", \$7.00.

Starrett Tools may be bought in any good hardware store. Send for our free catalog No. 20M describing other tools for carpenters and builders.

**THE L. S. STARRETT COMPANY**

*World's Greatest Toolmakers*

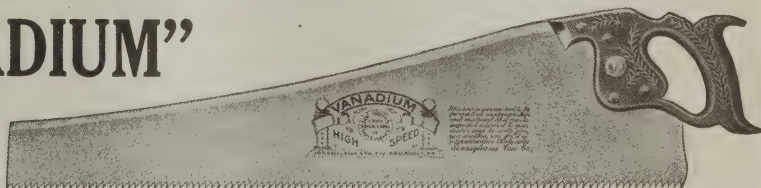
**Athol, Massachusetts**

42-396

**At Least 75c For Every National Builder Reader ::::**

## "VANADIUM"

**The King of Hand Saws**



20"	22"	24"	26"	28"	30"
\$2.00	\$2.15	\$2.30	\$2.50	\$2.70	\$2.90

Straight or Skew Back, in Hand, Panel or Rip—any Teeth Desired. All Styles. Vanadium Steel Saws made of Vanadium High Speed Steel, hardened and tempered by a secret process. If the Vanadium Steel Saw does not give better service than any other saw you have ever had, return it and your money will be refunded.

### VANADIUM STEEL SAWS

have proven so satisfactory to every user, that once you try them, you will always use them.

#### OUR PROPOSITION

In order to get at least one Pennsylvania Vanadium saw into the hands of every National Builder tool user we offer a reduction of 75c cash from prices shown herewith on **every** saw ordered on coupon attached—and it will come prepaid too.

**Send In For Your Trial Saw**

**Pennsylvania Saw Co., Frackville, Pa.**  
Manufacturers of Saws, Scrapers, Try Squares, Etc.

**Pennsylvania Saw Co., Frackville, Penna.**

Gentlemen:-

I enclose \$..... for a trial saw Length..... inches. Teeth..... pts. Narrow or

Wide Blade..... Straight or Skew Back..... prepaid. I am a National Builder reader.

Name.....

Address.....

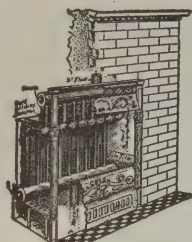
Name of Dealer.....

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## Latest Designs In Hardwood and Tile Mantels

Our Patented Fire Place  
Heaters Heat One to  
Five Rooms

Write for Catalog, Stating Your Requirements

HEITLAND GRATE & MANTEL CO.

129 No. Fifth Street

Quincy, Illinois



## Hess <sup>MEDICINE</sup> ~~SANITARY~~ <sup>CABINET</sup> Locker

The Only Modern, Sanitary  
STEEL Medicine Cabinet

or locker finished in snow-white, baked ever-lasting enamel, inside and out. Beautiful beveled mirror door. Nickel plate brass trimmings. Steel or glass shelves.

### Costs Less Than Wood

Never warps, shrinks, nor swells. Dust and vermin proof, easily cleaned.

### Should Be In Every Bath Room

Four styles—four sizes. To recess in wall or to hang outside. Send for illustrated circular.

HESS, 907 L Tacoma Bldg., Chicago.  
Makers of Steel Furnaces. Free Booklet.

The Recessed Steel  
Medicine Cabinet

## \$50 BOVEE ECONOMY FURNACE \$50

Saved by buying a

At Manufacturer's Prices

Has a large combustion chamber. Saves one third of the fuel. Has perfect

### Ventilating System

The Most Perfect  
Hot Air Plant Sold

Send pencil sketch of floor plan for our manufacturer's price and illustrated catalog.

Bovee Furnace Works  
60 8th Street Waterloo, Iowa



## FULL LINE of PLUMBING and HEATING SUPPLIES

Sold Direct at  
Wholesale Prices

20% to 40%  
Saving

Complete bathroom  
outfits, tubs, closets,  
lavatories, kitchen

sinks, etc. Prompt shipment from a complete stock. The only house selling up-to-date, guaranteed goods at wholesale direct. Write for illustrated catalogue and prices.

B. Y. Karol, 800-802 So. Kedzie Ave., Chicago, Ill.

apolis, 63; St. Paul, 115; Cincinnati, 58; Indianapolis, 5; Louisville, 73; Salt Lake City, 33; Wilkes Barre, 90; Allentown, 9; Kansas City, Kans., 28; Peoria, 13; Canton, Ohio, 6; Sioux City, 25; while the smaller cities in New England, New York, New Jersey and Pennsylvania show some remarkable increases, notably Springfield, Mass., 136; New Haven, 131; Albany, 38; Bridgeport, 53; Syracuse, 111; Hartford, 53; Atlantic City, 174; Erie, 88; Reading, Pa., 7; Haverhill, 377; Lawrence, 370; Brockton, 34; Troy, 76; Elizabeth, 73; Bayonne, 164; New Britain, 408; Passaic, 929; Utica, 58. There were other notable increases including Baltimore, 134; Washington, 1; Atlanta, 41; Norfolk, Va., 78; Stockton had an increase of 54; Superior, Wis., 36, and Grand Rapids, 27.

Some pretty big decreases are also to be noted, of course, but it should be remembered that the comparisons this year are with high records in the past and are therefore not so serious. For example, Chicago, which has been piling up high records for a long time, had a loss of only 8 per cent; Brooklyn, 47; Detroit, another busy city, 57; Newark, 23; San Francisco, 82; St. Louis, 23; Pittsburgh, 69; Los Angeles, 61; Toledo, 25; Milwaukee, 29; Seattle, 36; Oakland, 23; Dallas, 43; Portland, Ore., 49; Buffalo, 22; Richmond, 4; Denver, 20; Columbus, 32; Birmingham, 37; Cedar Rapids, 9; Sacramento, 38; San Antonio, 8; Akron, 44; Memphis, 63; New Orleans, 52; San Diego, 41; Berkeley, 7; New Bedford, 17; Duluth, 43; Omaha, 62; Ft. Wayne, 22; Youngstown, 6; Savannah, 35; Trenton, 7; Nashville, 18; Des Moines, 48; Tampa, 47; Paterson, 13; Tacoma, 66; Scranton, 34; Binghamton, 47; Harrisburg, 8; Topeka, 20; East St. Louis, 61; Pasadena, 56; Chattanooga, 69; Lincoln, Neb., 11; Waterbury, 52; San Jose, 35; Spokane, 10; St. Joseph, Mo., 37; Altoona, 83; Niagara Falls, 79; Dayton, 71; Saginaw, 3; Colorado Springs, 90; Hoboken, 96; Butte, 90; Pueblo, 87; Holyoke, 67; West Hoboken, 79; Schenectady, 56; Woonsocket, 84.

## New Metal Ceiling Features

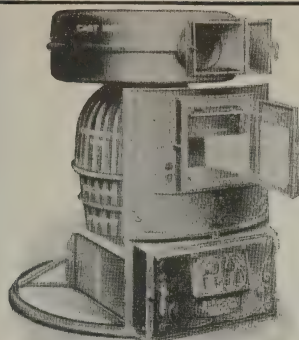
Metal ceilings, to be entirely satisfactory, must be more than merely stamped sheets to be nailed in place by anyone

Advertisers' Section.

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ON LETTERS YOU  
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## Robinson Gem Furnace

Furnace value is a matter of **heat-ability**. On account of several special features the **Robinson Gem Furnace** will actually give **more heat at less fuel cost** than others. We are prepared to **prove this**. Recommend and install Robinson Furnaces in the homes of your customers, and you'll give them heating **satisfaction**.

### Direct From Manufacturer to You

We sell direct to building contractors and home builders in and near Chicago; in other localities we sell through dealers. Our sales plan provides for a good profit for the contractor. Investigate the reasons why the Robinson Furnace is good for your customer and profitable for YOU.

**Robinson Furnace Co., 205-7 W. Lake St., Chicago**

## GAS PLANTS for COUNTRY HOMES

EVERY suburban and country home, large and small, can have gas for lighting and cooking.

### MILBURN PLANTS

make gas which is better than city gas and costs no more. Machines are simple, automatic and durable. Write for Catalogue V-22.

The Alexander Milburn Co.  
Baltimore - Maryland



**"GUARANTEED"**  
GRADE "A" PLUMBING  
HEATING SUPPLIES.

**DIRECT TO YOU AT**

**WHOLESALE PRICES**

**J. HARDIN CO.**

35 YEARS AT 47TH - AND COTTAGE GROVE AVE  
CHICAGO.

SEND FOR CAT. 31

### Everything in GUARANTEED PLUMBING and HEATING SUPPLIES at WHOLESALE

Bathroom Outfits, Sinks, Pipe, Fittings, Valves, Faucets, Heating Boilers, Radiators, Water Pressure Systems and Lighting Plants for Country Homes, etc. Our \$200,000.00 plant behind our GUARANTEE. Send for complete Catalog No. 31.

## ROOFING SLATE

OF QUALITY

MINERS

MANUFACTURERS

**The AULD & CONGER Co.**  
DEPT. D

ESTABLISHED

1870

CLEVELAND OHIO

## WAGNER STUDDING SOCKETS

### FOR CEMENT FLOORS

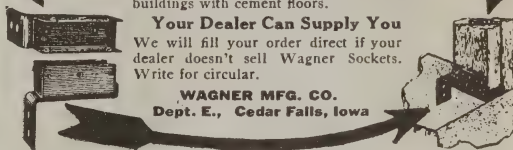
—easiest, quickest, best way to anchor studding to cement floors. Takes but a minute or two to set the sockets in fresh cement, and once the cement is set, the sockets hold forever.

Protect bottoms of studding against decay and insure long life to the building. Used for garages, barns, and all frame buildings with cement floors.

#### Your Dealer Can Supply You

We will fill your order direct if your dealer doesn't sell Wagner Sockets. Write for circular.

**WAGNER MFG. CO.**  
Dept. E., Cedar Falls, Iowa

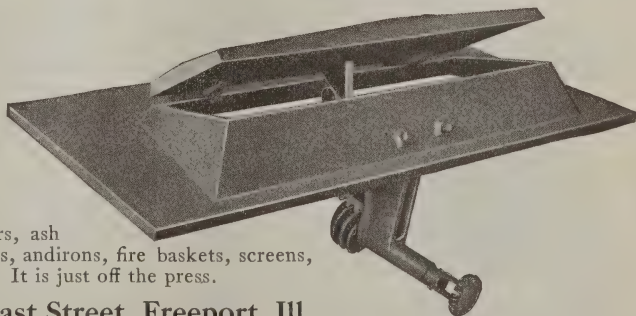


## Fireplace Equipment

This Fireplace Damper is very easy to erect, low in price, and will give the best of service. The operating lever extends under the brick or tile.

Send for our catalog showing dampers, ash trap doors, clean out doors, thresholds, andirons, fire baskets, screens, spark guards, gas logs, fire sets, etc. It is just off the press.

**STOVER MFG. CO., 35 East Street, Freeport, Ill.**



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## The "BEST" Fuel Chute

The "BEST" Coal Chute is also a window, and can be made into a ventilator if desired. A heavy screen pro-

fects the glass when chute is open. Chute cannot be opened from outside. Also made with solid cast door. Three sizes. Easily installed in new and old buildings. Our new catalog illustrating and describing

### THE BEST LINE—BUILDING HARDWARE

is just off the press and is of interest to every live Contractor and Builder. Our line includes Coal Chutes, Chimney Caps, Revolving Tops and Copings, Cleanout Doors, Cistern Covers, Stud Sockets, Foot Scrapers, Cesspools, Hog Waterers. Write us for the new catalog. Please give us your dealer's name.

Sterling Foundry Co., 800 Wallace St., Sterling, Illinois

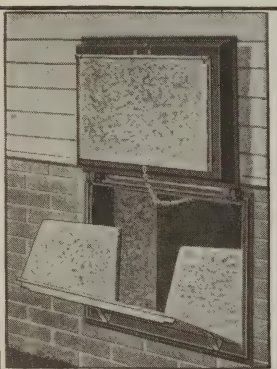


## GIBSON FURNACES

Burn smoke and gases—cut down ordinary fuel costs one half; the special construction of the combustion chamber is the reason why.

Install Gibson Furnaces in your customers' homes—satisfaction for them, profit for yourself. We sell direct to contractors. Get literature, prices and trade discounts by writing us today.

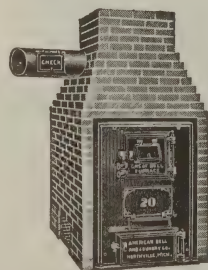
Gibson Mfg. Co.,  
415 Miles St., Waterloo, Ia.



## "JULIEN" Coal Chute

A perfect coal chute and an attractive looking basement window. Lets light in; keeps burglars out. Locks automatically from the outside; opens only from the inside. When in use the door protects the building, and a steel shield protects the glass. Write for circular, prices and discounts.

Loetscher-Ryan Mfg. Co.  
Main St., Dubuque, Iowa



## A Hot Air Furnace

you ought to know about. Costs no more than a base burner, heats twice as much on about the same amount of fuel. No pipes, no lost heat. Brick or portable. Write and learn.

American Bell & Foundry Co.  
Northville, Michigan

capable of swinging a hammer. The Berger Mfg. Co., Canton O., improved the method of manufacturing plates and their two latest features are real improvements. The first of these is their "Never Slip Nailing Point," which insures that the nail will be driven in exactly the right place without a chance to slip or slide, damaging the entire appearance. Another feature is in the extra long bead, which makes a tight and perfect fitting joint requiring neither tamping nor calking.

It will also interest our readers to learn that Mr. E. B. McMaster, formerly commissioner for the Associated Metal Lath Manufacturers, is now the manager of branches for the Berger Mfg. Co. Mr. McMaster's name is familiar to all of our readers through the numerous excellent articles which he has contributed to the National Builder on metal lath, a subject on which he is a recognized authority.

### Ceiling Decorations in Metal

There are many reasons why Metal Ceilings have proven popular. In the first place they afford considerable protection against fire. In the second place they are ornamental, while they are light in weight and are economical both in cost and in erection. Metal Ceilings are in many ways preferable to plaster as there is no danger of their becoming loose through vibration or damaged by water leaking through the floor or roof above.

Metal Ceilings lend themselves to two forms of decoration. They may be in themselves artistic in design, the stamped sheets being laid to a definite pattern while coved ceilings, beams, rafters, etc., can be introduced at comparatively small expense. The metal plate itself may be readily painted or decorated in a great variety of ways to suit any particular ideas of taste or design.

Any Company which undertakes to furnish Metal Ceiling Plates must first of all have a very complete outfit of patterns and dies so as to produce plates of the highest quality in a sufficient variety to satisfy any design which comes upon them. The Kanneberg Roofing & Ceiling Co., Canton, O., indicates in their catalog that they are amply prepared to furnish designs which will please the most critical

Advertisers' Section.

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# Contractors Everywhere

are buying and installing Hess Steel Furnaces;

**Because** the entire equipments are planned and prepared by us at our factory and shipped complete with full directions for installing and connecting;

**Because** we guarantee absolute success;

**Because** we offer these equipments on trial till January 1st, your own banker to hold the purchase money until the heater has proved satisfactory;

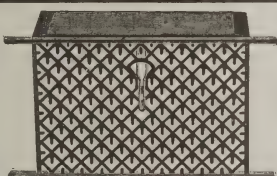
**Because** we offer contractors concessions and a Profit Sharing allowance which we do not give to any other class of buyers.

When you need another heater it will pay you to learn just what we can offer. Ask us more about it.

**Hess Warming & Ventilating Co.**  
907 Tacoma Building Chicago, Illinois



## BARBEE AIR GRATE



Grate Open

—Opens and Closes to Suit the Seasons

Push a lever to open it in the Spring; pull the lever to close it in the Fall. Keeps the cold out more effectively than boards or sacks do, and is far more sightly. Easily installed, indestructible, costs little. Made in four sizes.

We have what the world is looking for—the Barbée Air Grate Opening and Closing Devices. Write for prices.

**Barbee Air Grate & Mfg. Co.**  
Owensboro, Ky.



Grate Closed

# Hot-Water Heating by the Andrews System

Seven Rooms and Bath  
**\$198**



**"Cut to Fit, Ready to Screw Together"** During 14 years we have sold these systems in 2274 cities and towns of this country. Practically all of them were sold on our "cut to fit" method—plants built complete in our shop and shipped ready to screw together by any man handy with tools. As an assurance of satisfaction we give **360 Days FREE TRIAL** Guaranteed by Bond

**ANDREWS Steel Boilers**

The most economical and easily operated boilers made. Have double the heating surface of other boilers. Built of steel plate like power boilers. Burn less fuel of any grade.

**72-Page Heating Book FREE**

Contractors, write for this book. Learn about the Andrews Systems, how they fit so perfectly into the contractor's way of doing business and how profitable they are to him.

Write Today  
**ANDREWS HEATING CO.,**  
1466 Heating Bldg.,  
Minneapolis - Minnesota



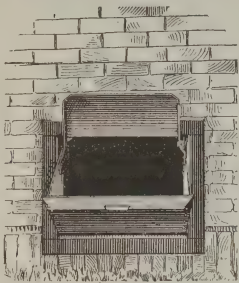
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## Kewanee All-Steel Coal Chutes



### Pay Profits

You, Mr. Contractor, can get this PROFIT, by installing Kewanee Chutes in your buildings.

Built entirely of steel—no cast iron nor glass to break or get out of order.

Automatic in action and easily installed in any building old or new.

Write for Special Proposition to Contractors

Kewanee Manufacturing Co.  
Kewanee Illinois

## Thurman Vacuum Cleaners

*Stationary and Portable*

**For Residences, Hotels, Office Buildings, Etc.**

**70 Different Types and Sizes**

Residential (built in the house) Stationary Plants from \$150.00 up. Our Engineering Department is at your disposal to lay out your pipe line gratis. *Write for free booklet.*



**Thurman Vacuum Cleaner Company**

(Originators Vacuum Cleaning Machinery)

Dept. F. Eleventh & Monroe Sts., St. Louis, Mo.

## The Enterprise Coal and Fuel Shute

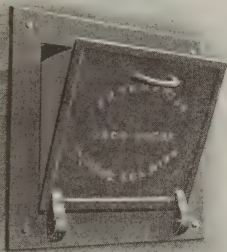
*The Easiest Installed*

Non-Breakable—and Cheapest and Simplest Fuel Shute made. Cheapest because simplest.

Only four pieces—Frame, Spout, Lock and Weight. Roller bearing hinges; no exposed bolts to tamper with. Positively no way to open it from the outside. All of cast iron—practically rustless.

Sent to any address on receipt of \$7.50. Write for Builders' and Dealers' Discount

**Enterprise Iron Works**  
Albert Lea, Minnesota



## Stock Shades Are Not Good Enough

for YOUR clients; give them something better. Install special made-to-order shades in the houses you build—and have built. The wearing qualities are greater—the appearance is superior.

Give us the measure and we will make shades to fit, using the highest quality shade cloth mounted on guaranteed rollers. You install the shades, get the credit and pocket the profit. Investigate!

**S. A. Maxwell & Co.**  
3636 Iron Street, Chicago, Ill



New York

Kansas City

eye and which can be adapted to any desired purpose. The catalog which we have before us shows a great variety of ceiling designs, with suitable borders, wall plates, center pieces, mouldings, etc., so that one should have no difficulty in selecting a pattern for any space which it is required to fill. With this catalog the contractor can solicit orders for any work of this character and he can order direct from the catalog as he will find in it directions for measuring and ordering as well as general instructions for applying the ceiling. The latter, while it possibly should not be given to the contractor until he has placed his order, will indicate to him how much work it is to prepare a room for the metal work and how long it will take him to finish the complete job. This catalog is sent to our readers on request, as well as more complete information as to the special proposition which the Kanneburg Roofing Co. are able to make to our readers at this time.

### Making Good

The Contractor must know when he figures a job just where he is going to make the saving which will land him the contract as well as make profits for him on the job. When any concrete is included the use of a Sackett-Chicago Low-Charge Batch Mixer will provide the contractor with a good excuse for trimming his price down to meet any competition and will still allow him price enough to come out on the right side of the ledger. The H. B. Sackett Screen & Chute Company, 1689 Ellston Ave., Chicago, Illinois, want to show every contractor how they can save money on a concrete job by the use of the Sackett-Chicago Mixer. There are numerous new features in this mixer which the contractor and builder should understand when considering the purchase of a mixer.

### An Automatic Screen Door Catch

The contractor is always looking for something new which will be a little better than the equipment which he has been using. The Automatic Screen Door Catch, made by the Watrous-Acme Mfg. Co., Des Moines, Ia., is one of the little features which appeals to every discriminating house owner and which can readily be the means of pleasing both the owner and the

Advertisers' Section.

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# AJAX

Low Down Construction

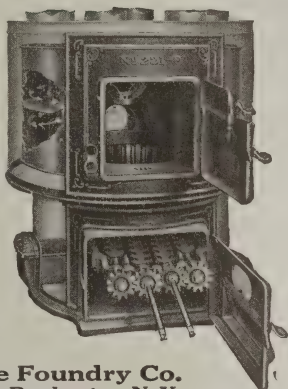
# AJAX

WARM AIR  
FURNACES

Should be recommended and installed by every Builder or Architect Builder. Built low for shallow cellars but just as good in deep ones. Twenty-five feet of fire travel; built so no soot, dirt or ashes come into the cellar; gives maximum heat with — well, our circular just off the press tells you all about it.

Handled by dealers, but we allow builders a special discount where we have no dealer.

**Co-Operative Foundry Co.**  
P. O. Box 1029, Rochester, N. Y.



From  
living  
room

Here is just that touch of up-to-dateness needed to make your houses easier to rent and sell.

A ready-to-install outfit of

## Western Electric Inter-phones

containing two hand set type intercommunicating telephones will save stair-climbing and calling from floor to floor.

Send \$15 by cheque or money order to Dept. 25-BL. An outfit will be sent by parcel post.

## Western Electric Company

Manufacturers of the 8,000,000 "Bell" Telephones

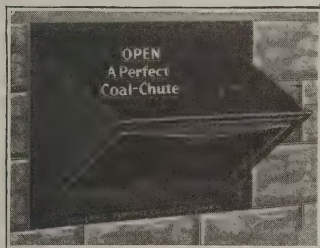
New York	Atlanta	Chicago	Kansas City	San Francisco
Buffalo	Richmond	Milwaukee	Omaha	Oakland
Philadelphia	Savannah	Indianapolis	Oklahoma City	Los Angeles
Boston	New Orleans	Cleveland	Minneapolis	Seattle
Pittsburgh	Houston	Cincinnati	St. Paul	Portland
St. Louis	Dallas	Denver	Salt Lake City	

**EQUIPMENT FOR EVERY ELECTRICAL NEED**  
Member Society for Electrical Development. "Do it Electrically"



To  
kitchen

## The Window Chute



**For  
Your  
Coal  
Bin**

The Window Chute is a selling feature for Any Residence or Building.

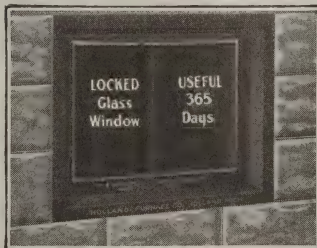
Ready for the Coal Man

Thousands in Use—The Very Best

**If You  
Build  
Buy  
Own**

Be Up-To-Date  
and Have the  
World's Best.

Write for  
Booklet C



A Light Basement

**Holland Furnace Co., Holland, Mich.**

World's Largest Direct Installers of Furnaces

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## Lumber and Building Material at Wholesale Mill Prices

We want every contractor and home builder to write us for our lumber catalog. It will give you our latest wholesale prices on all grades of lumber delivered to your station, and will explain to you our liberal plan of doing business.

Lumber bills and millwork furnished promptly and accurately for all kinds of buildings at lower prices than ever before quoted. Estimates furnished promptly. Send us your bills for our low delivered prices.

**Book and Samples Free** Write us today for our up-to-date price catalog and information whether you wish to buy or not. Asphalt roofing and shingles sold at less than factory prices. Write for samples.

**HOME LUMBER & SUPPLY CO.**  
343 S. Dearborn St., Dept. 8 Chicago, Ill.

## BUILD YOUR OWN GRANDFATHER'S CLOCK

*With Our Help*

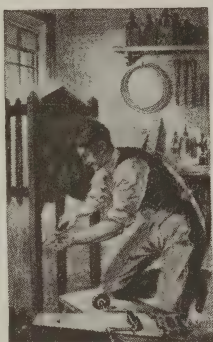
We furnish blue prints, finishing material and instructions. Buy the works, dial weights and pendulum from us at surprisingly low prices.

You make a fine profit building artistic clocks for your friends.

Complete works, \$5.00. Others with chimes at all prices.

Ask for attractive free offer.

**CLOCK COMPANY**  
1657 Ruffner St., Philadelphia, Pa.



## DO YOU KNOW

Mr. Home Builder, that the cellar of your residence can be made absolutely and permanently watertight by the simple application of 1" finish of Portland Cement with Bitu-Mortar Waterproofing Compound added, over the inside walls and floor?

Let us tell you about our products.

The Bitu-Mortar Waterproofing Company

**BITU-MORTAR**  
**WATERPROOFING**  
WATERPROOFS PERMANENTLY

Engineers, Contractors and Manufacturers

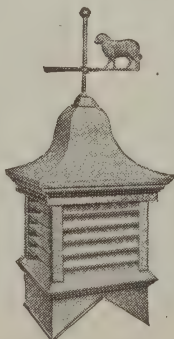
340-342 East 27th Street

New York, N. Y.

## A Gale Cupola In Your Plans

will mean fresh air without draft in the building. Heavy galvanized iron construction—look good—moderate priced. Storm and bird proof. Write for tradeterms

**Galesburg Sheet Metal Works**  
142 So. Prairie St., Galesburg, Illinois



tenant of a building. This device is arranged to hold the door firmly closed and yet to allow the door to be readily opened, except when a night latch attachment is closed. Being entirely automatic in its action, this catch cannot fail to work through the operator neglecting to turn a knob, push a button, pull a string or turn or twist something or other before opening the door. It means protection against flies and mosquitos and also freedom of the annoyance of rebounding, slamming and rattling doors.

The Automatic Screen Door Catch is furnished in either brass or steel and can be used for either new or old doors. While practically every hardware dealer handles this catch the Watrous-Acme Mfg. Co. will be glad to hear from any of our readers in order that they may send their complete catalog of other screen hardware and time saving hardware specialties.

## Metallic Batten Strips

No matter how carefully lumber may be prepared nor with what care it is erected the weather will sooner or later have an effect upon it. When wide boards, that is, 6 to 10" wide, are used for barn siding, placed vertically, it is an absolute certainty that sooner or later cracks will open up between them, due to their shrinking and drying out in the air.

There have been a number of methods used to overcome this difficulty. Batten Boards are sometimes nailed over the cracks but these are unsatisfactory as they can only be nailed to one board. The most satisfactory method is through the use of Metallic Battens which are so made as to be fastened to both boards and yet allow for expansion and contraction without danger of splitting the boards or opening up the slightest crack to the weather. Being of metal there is no tendency whatever for them to warp, twist, or buckle, in fact they preserve their shape as long as the building stands and they prevent any joint, which would be unsightly in itself, as well as permitting the wind and rain to blow through, damaging the contents of the barn and causing dangerous drafts to any animals housed therein.

Department M of the Metallic Batten Co., Owensville, Ind., has prepared attractive samples of their Metallic Batten for

Advertisers' Section

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Make it a special point to take up the refrigerator question with your client. Whether you are erecting a large hotel, restaurant, hospital, institution, a fine palatial residence or a modest home, the refrigerator is all important

## McCray Sanitary Refrigerators

*Either Ice or Mechanical Refrigeration*

McCray Refrigerators are built in a great variety of regular stock sizes—ready for immediate shipment. Also built to order in any size or design to fit any space for any special requirement of

Residence  
Clubs  
Public Institutions

Hotels  
Restaurants  
Deli-nessen

Grocers  
Meat Markets  
Commissaries

Hospitals  
Railroads  
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Florists  
Creameries  
Dairies

### Get These Catalogs—For Your Files

No. 92—Regular Sizes for Residences  
No. 50—For Hotels, Clubs, Institutions

No. 73—For Florists

No. 61—For Meat Markets  
No. 69—For Grocers

McCray Refrigerator Co., 748 Lake St., Kendallville, Ind.

New York: McCray Bldg., 7-9 W. 30th St.

Chicago: 1000 S. Michigan Ave.

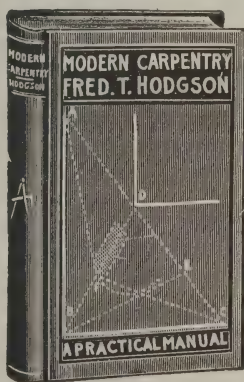
For Salesroom in your City see local Telephone Directory

### Plan Service FREE

**ARCHITECTS:** We have a corps of practical draughtsmen trained in the principles of correct and scientific refrigeration and will gladly furnish you with suggestions, blue prints and specifications of any refrigerating problem that may confront you. There is absolutely no charge for this service.

## Modern Carpentry and Joinery

Vol. 1. By Fred T. Hodgson, F. A. I. C. 300 pages, 318 illustrations, 12mo. cloth binding



This is a real modern work and the large numbers of it that have been sold (over one million) is an evidence that American workmen have found in it the things they expected. It is one of the best books of the kind ever brought out for teaching the young workman the art of correct and easy woodworking.

### It Shows How to Lay Out Roofs

rafters, stairs, hoppers, bev-els of all kinds, mitering, coping, circle work, floor- ing, splayed work, plain stairs and handrailing, corn-icing, dovetailing and many other things the young car- penter will require to know in the performance of his regular work.

It is written in a very simple style, and can be understood by any person who can read every-day English. Unlike other works prepared for workmen, it is devoid of bewildering formulae and algebraic puzzles, and the reader is not asked to wade through long mathematical calculations to get at the kernel of the subject before him.

Price, Postpaid, \$1.00

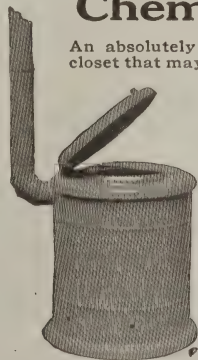
HODGSON BOOK COMPANY  
537 So. Dearborn St., Chicago, Illinois

## Carpenters—

### You can Save Money on Every Spring Job

Here's something right in your line—a Chemical Closet that you can sell to a home builder cheaper than a wooden privy and make a bigger profit for yourself. Here's something you can sell at odd times or turn over to your son or your foreman to sell.

## RO-SAN Chemical Closet



An absolutely sanitary, odorless indoor closet that may be placed anywhere in the house. Abolishes the germ-breeding outdoor vault. A comfort and a convenience where there is no sewer connection. Germs killed by chemical. Easily emptied as the ash pit of a stove.

### Agents Wanted

We want one live carpenter contractor in each town to act as our agent. Good profits for little work. We help you sell them. Write today for complete details.

**Rowe Sanitary Mfg. Co.**

203-A 6th St., Detroit, Mich.

Ask about the Ro-San Washstand. Hot and cold running water without plumbing.

PASTE THIS DOME  
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distribution among our readers. At the same time they will send on request such other information and data as will be of use to the contractor including prices, etc. No contractor can afford to be without these samples and information as the Battens should be put on every new building, while the old buildings furnish an excellent opportunity for the contractor to approach the farmer with a view of securing a contract for placing the Battens on the Building and possibly interesting the farmer in other new work.

---

### The Question of Profits

Every one from the farmer to the ultimate consumer is interested in profits. The farmer wants better returns for his work, the contractor demands more profits for his efforts and the question is how can every one be satisfied and still furnish work for every one.

The Mullins Mfg. Co., Brillion, Wis., manufacturers of barn stable equipment, believe that the first big necessity in farm construction is a suitable place in which to house the animals. They have, therefore, designed their equipment in such a way as to mean greater comfort for the animals, less labor in caring for them and a more satisfactory appearance all around.

The Mullins Mfg. Co. have a folder entitled "Answering the Stable Question" and this folder will be of interest to every contractor and builder who has ever had, has now, or hopes to have, a farm building problem to answer. The folder will show the contractor what the better class of farmers and contractors are doing and how they are providing better farm facilities. A great many of our readers are making a special study of farm equipment and this folder will be of value to them.

---

### A Useful Calendar

The Andrews Heating Co., 1464 Heating Bldg., Minneapolis, Minn., are sending to our readers on request a calendar which will be of both interest and value to them. The calendar contains besides the days in large plain figures, a great deal of valuable information on heating, plumbing and lighting. The Andrews System is adapted to all classes of buildings from the smallest cottage to the largest office building or manufacturing plant, while their guaran-

tee seems to be eminently fair and equitable.

The Andrews Co., being specialists in plumbing, heating and lighting, have of course designed a great many special pieces of equipment, such as boilers, radiators, thermostats septic tanks, safety valve expansion tanks, water supply systems and gas lighting systems. These are all described in more or less detail in the above mentioned calendar, but the Andrews Heating Co. will be glad to give the contractor such other further information as may be needed.

The Andrews Heating Co. have a special proposition to readers of the NATIONAL BUILDER by which they will prepare special plans for any of the above subjects for any building which the contractor contemplates erecting. This will allow the contractor to go before the owner ready to answer any question regarding the subjects whether it be location of fixtures, size, weight or price. It would seem wise for the contractor when jobs of this character come up to confer with the Andrews Heating Co. and get their expert advice.

---

### Quality Work

Every contractor starts every job with the idea of making it a little better than the one he just finished. He knows that quality counts and that quality shows. The job which is well finished with the best materials stands as a recommendation for him while the use of inferior materials put up by careless and indifferent workmen means trouble for him as long as he is in the contracting business. Not even fire can wipe out an unsatisfactory building for there will always be those who will say that the first itself was due to loose construction.

S. D. Mayer & Co., 318 No. B St., Hamilton, O., have for years been known as Quality Manufacturers. Their millwork, sash, doors, screens, kitchen cupboards, china closets, etc., have that appearance of refinement which always accompanies Quality both in material and workmanship. They want to get acquainted with those of our readers who appreciate something a little better than the average, something which will please the owner in Quality and please the contractor in price. Their proposition is ready for our readers.



**A GOOD REFRIGERATOR** must have real inside value to secure satisfactory results.

Real value means—perfect insulation of all walls, close fitting doors—positive circulation of pure air—inner walls that can be kept clean and sanitary.

You can always feel safe in buying for your own home and in specifying, recommending and installing the **Herrick** for homes, hotels, stores, clubs, cafes, etc., you are building.

We want to send you **free** plans and specifications for outside icing, they are inserted in back of new Catalog No. 23 N which is free on request.

**Herrick Refrigerator Co., Waterloo, Iowa**



# Herrick

## When You Want — Tiles and Mosaics



### Write

### Artistic Designs and Superior Quality


For Bathrooms, Kitchens, Hallways, Drug Stores, Ice Cream Parlors, Banks, Buffets, Walls, Wainscoting, Store Entrances.

We carry a most complete line of Ceramic Mosaic Floor Tile and Sanitary Glazed Wall Tile for every purpose. Our designs are unusually artistic and correctly executed. The quality is *Lorenzen*—the best guarantee a builder can get. You can depend upon our prices being *right*.

Let us estimate on your next job or furnish you with an original design. At any rate, write for our Catalog No. 51 on Tiles and Mosaics. A postal will bring it and it is invaluable for your files. Our large booklet, "*Vogue in Fire Places*," the most comprehensive and complete catalog ever issued on fireplaces should also be in your files. Write for it.

**Send for our discount proposition to carpenters and builders.**

**Chas. F. Lorenzen & Co.**  
101 Washington Street Chicago, Ill.



## Here's Your Chance!

Good live men, here is a chance for you to build up an independent, profitable business for yourself right at home. Many agents are now devoting their entire time to selling Edwards' Metal Ceilings.

**Big Quick Profits** are being made by others who are simply devoting part of their time to selling and applying

## EDWARDS' Metal Ceilings

Fill in and mail the coupon below today. The territory is going like hot cakes. One day's delay may cause you to lose out. The coupon brings our special agents' proposition and large, handsome catalog of attractive designs.

### The Edwards Mfg. Co.

*"The Sheet Metal Folks"*  
430-450 Eggleston Ave., Cincinnati, Ohio

**Mail This Coupon Right Now**

THE EDWARDS MFG. CO.,  
430-450 Eggleston Ave.,  
Cincinnati, Ohio


Send me details of your agency plan and a copy of your Steel Ceiling Catalog.

Name .....

Address .....

Business .....

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## A BIT OF UTILITY

Guided by its circular rim—instead of its centre—the Forstner Labor-Saving Auger Bit will bore any arc of a circle, and can be guided in any direction. Doesn't matter how hard the wood is, no consequence

whether it is full of knots, or the grain awkward to negotiate. The Forstner Bit works with equal smoothness under any condition and leaves a true polished surface on every job.

## UNEQUALED FOR DELICATE WORK

Supersedes chisels, gauges, scroll-saws, or lath tools combined, for all kinds of delicate work. Cabinet and pattern makers and carpenters are enthusiastic because they do more work than other bits and

cost no more. We can offer something special in the matter of price on sets packed in a sensible box. Send today for particulars and catalog.

**THE PROGRESSIVE MFG. CO., Torrington, Conn.**

Forstner Auger Bits



## SARGENT

Other Sargent Quality

Tools are described in the Sargent Tool Book, a handbook for mechanics sent on application.

No. 53.

A light floor and veneer Scraper. The clamp binding screw is steel and will not strip. Wood face lessens friction.

A useful and convenient tool. If your dealer cannot supply you, we will send prepaid, on receipt of \$1.75.

For full description of this and other

**SARGENT WARRANTED PLANES**

SEND FOR SARGENT PLANE BOOKLET

**SARGENT & COMPANY**

Makers of Squares, Planes and Mechanics' Tools

52 Water St. New Haven, Conn.

## SAND'S ALUMINUM LEVELS

### WILL NOT WARP

Sand's Aluminum Levels are light, strong and durable. They will not warp, split or rust. Nothing to work loose or get out of order. Easy to handle. Need no adjusting. Made in 18", 24" and 30" sizes for Carpenters and 42" length for Masons. We also make a high-grade line of wood levels.

are honestly made of very high-grade aluminum specially prepared for this purpose. The finish is ideal and the greatest strength is placed where most needed. All unnecessary weight is left out. The plumbs are the best that careful experience can make. Each level is fully tested before it is offered for sale. You can count on Sand's Levels being perfect.

### ASK YOUR HARDWARE DEALER

to show you Sand's Levels. If he does not sell them let us know, and we will send you a circular showing full size view of our 24" Aluminum Level and ½ view of the 30". Just like seeing the actual levels.

**J. SAND & SON, 1023 Rivard St., Detroit, Mich.**

### Best Level To Use In Dark Places

The plumbs at each end and the double center level make it readable in any position and at arm's length. Pick it up any way. It is always in position. Vials covered with heavy plate glass which keeps out water, dust and dirt. A Sand's Aluminum Level will last you a lifetime.



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### The "Best" Fuel Chute

The "Best" Fuel Chute, made by the Sterling Foundry Co., 800 Wallace St., Sterling, Ill., is designed to do more than merely furnish a means of placing fuel in the basement. This fuel chute is designed as a window when not in use as a chute, while it is further arranged to provide ventilation when desired.

As many of the older buildings were built without thought of getting fuel into the basement except through the ordinary windows you find many buildings in which the owner merely needs his attention called to it in order to provide work for the contractor in putting it in. This fuel chute is arranged to be installed either in old buildings or in new buildings under construction.

The Sterling Foundry Co. have a catalog of builders' hardware which will be interesting to every contractor and builder as it shows besides coal chutes, chimney traps, coupings, clean outdoors, cistern covers and many other items of every day use. Many of these are specialties made only by the Sterling Co. and the contractor or builder who sees the catalog immediately appreciates the value of all of the articles.

### Helpful Hints for Barn Builders

Just as soon as a contractor realizes that the specialist knows more than he does about any one given subject, just so soon will the contractor be better off. In the matter of barn construction the James Mfg. Co., A. H. 102 Cane St., Ft. Atkinson, Wis., have made a careful study of all the problems surrounding the barn proposition not only from the farmers' standpoint but from the contractors'. They are, therefore, in a position to advise our readers as to the best methods of not only designing but of constructing and erecting a sanitary barn.

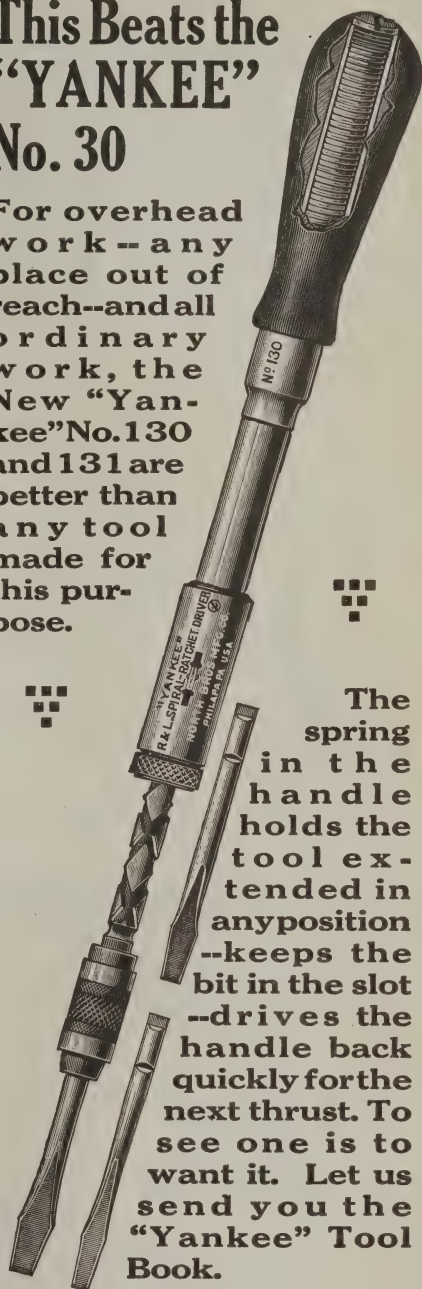
The James Mfg. Co. advise us that numerous contractors come to their place to consult with them regarding the equipment which should be installed in a high grade barn and also on matters respecting the construction in general.

The subject of ventilation is one which is very important to the farmer as it means better health for the animals and consequently better returns for the money in-

Advertisers' Section

## This Beats the "YANKEE" No. 30

**For overhead work -- any place out of reach--and all ordinary work, the New "Yankee" No. 130 and 131 are better than any tool made for this purpose.**



**The spring in the handle holds the tool extended in any position -- keeps the bit in the slot -- drives the handle back quickly for the next thrust. To see one is to want it. Let us send you the "Yankee" Tool Book.**

**North Bros. Mfg. Co.**  
Department N, Philadelphia, Pa.

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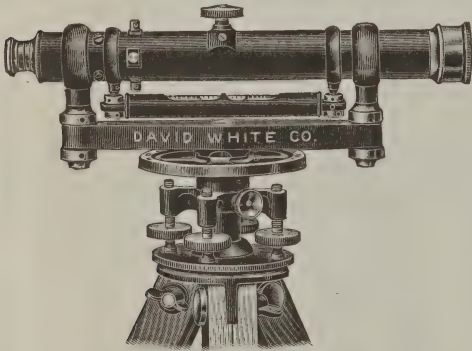
vested and food consumed. It means far less care to the farmer and his men and the James Mfg. Co. have numerous reports from contractors, owners, etc., who have found their system to be advantageous.

### Delivered Prices on Lumber

The Home Lumber & Supply Co., Dept. 6098, 343 So. Dearborn St., Chicago, Ill., have a most attractive proposition to contractors and builders. Their latest catalog contains prices on lumber, mouldings, flooring, lath, shingles, and other building supplies and a most novel feature consists in the fact that the prices given are so arranged as to show instantly the cost at any freight station. This arrangement saves the contractor a great deal of time and trouble figuring what the material will cost and then adding the freight to their station, with the possibility of errors and omissions.

### The Dumpy Level

The chief advantage of the Dumpy Level, recently placed on the market by the David White Co., 420 E. Water St., Milwaukee, Wis., and which is illustrated by the cut, is its great strength and rigidity. The adjustments of this instrument are also more permanent than that of the "Y" Level, although the "Y" Level, on



The Dumpy Level for Architects and Contractors

account of its having more intricate adjustments, is capable of doing more accurate work. Yet the Dumpy Level, which is sufficiently accurate to meet the needs of the average contractor, is becoming more of a favorite because of its ability to stand rough usage without injury to the instrument or its adjustments. The David

White Co. further points out that the above illustrated Level is but one of its many styles of instruments designed especially for the contractor and builder, all of which are shown in their new free illustrated catalog, which will be gladly sent postpaid to all interested contractors.

### Oak Flooring

To be satisfactory, flooring must be something besides merely oak lumber. Lumber itself must be carefully selected and carefully manufactured. Each individual piece must be examined for color and quality. The machinery must be in perfect condition and adjustment or it will not turn out the highest grade of oak flooring.

Mr. Paul O. Moratz, First Nat'l Bank Bldg., Bloomington, Ill., makes a specialty of the highest grade of oak flooring. The sizes which he finds in the greatest demands is the  $\frac{3}{8}$ " thick with width of  $1\frac{1}{4}$ ",  $1\frac{1}{2}$ " and 2". He carries these three grades in stock carefully selected, end matched, thoroughly kiln dried, and tied with wire to insure its delivery in first class condition. Those of our readers who use oak flooring, whether in occasional jobs or as a specialty will be interested in seeing the quality and also the prices of this flooring.

### Rustproof Alumina Screen Cloth.

The first cost of screens is not necessarily the last cost. Unless the highest quality of screens has been used it will be necessary to repair, repaint and replace the screen the second year, if not the first, that they are exposed to the weather.

The Reynolds Wire Co., Dixon, Ill., in manufacturing their Rustproof Alumina Screen Cloth, take particular pains to provide a material practically proof against the weather. The screen is not only coated with copper and chemically pure zinc, but it is given a rust resisting lacquer finish which preserves the natural color. We understand that the Reynolds Wire Co., in order to show contractors and builders as well as owners the good qualities of their screen will send them without charge a sample of the screen as well as the circular which describes in detail the manufacture and good features of this screen.

**MILLERS FALLS  
TOOLS**



## When a Man Buys a Mitre Box—

he looks for features that insure accuracy and speed in angle sawing. The Millers Falls Acme Mitre Box is the product of tool-makers who know the users' requirements intimately.

Consider the many advantages of each of the following features:

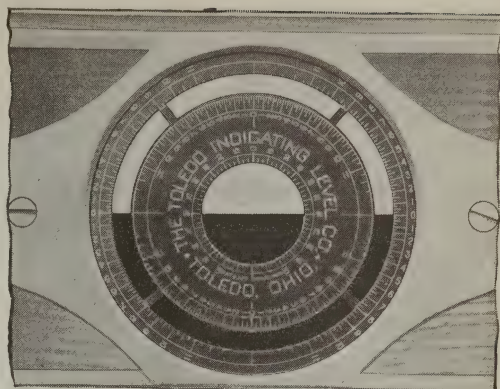
Saw supports may be instantly locked at either a positive or an intermediate angle. Graduated arc and index plate show where to set saw for any cut. Gauges may be set to stop the saw at any depth required. Length gauge permits sawing duplicate lengths with one adjustment. Simple automatic device holds saw guides when raised to the highest point and releases instantly. Slotted support is always immediately beneath saw and holds the work to prevent splintering at end of cut.

## MILLERS FALLS LANGDON ACME MITRE BOX IMPROVED

Ask your dealer to show you this Mitre Box, and also Millers Falls Hand Drill 1980, Hack Saw 1027, Breast Drill 112, Bit Brace 872 and Bench Drill Press 210. They have many time-and-labor-saving features. Send for catalog describing our complete line.

Millers Falls will exhibit in Block 26, Avenue D, Manufacturers' Building, Panama-Pacific Exposition.

**MILLERS FALLS CO.**  
Millers Falls, Mass.



## Yes, It's the Level That Talks

*It's All in the Fiery Red Indicator*  
**QUICK—SURE—ACCURATE**

If you're out of plumb or level a quarter of an inch per foot—bingo!—the indicator registers it instantly and accurately, where and how much to the foot. Also registers in degrees deflection from level or plumb.

If Mr. Level were to talk right out and say, "Mr. Man, you're just a quarter of an inch per foot high at the right end," it couldn't be any plainer than the silent indicator shows.

*Carpenters, Contractors, Builders, Masons and Mechanics, EVERYWHERE unite in saying the Toledo Indicating Level is perfect.*

There's no guess work. Simply adjust your work according to the indicator and you're through. No further testing—the work is right. One move instead of a dozen. Especially efficient for all kinds of roof and cement work.

## Needs no Adjustment

The Toledo Indicating Level requires no adjusting. The indicator of the level is securely fitted into the stock. No chance of the level ever getting out of order or adjustment. Strongly and rigidly constructed; practically unbreakable.

No. 105	—24 in. long	Price \$5.00
No. 105A	—24 in. long, all brass bound	" 6.25
No. 106	—30 in. long, all brass bound	" 6.50
No. 107	—30 in. long	" 5.25

Ask for general circular showing complete line

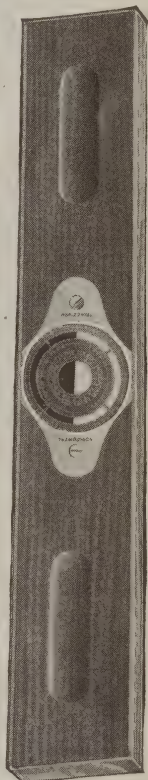
**The Toledo Indicating Level Co.**  
2041 Nicholas Bldg. - Toledo, Ohio

**COUPON**  
**Free Examination Offer**

**The Toledo Indicating Level Company,**  
2041 Nicholas Bldg., Toledo, Ohio

Gentlemen:—Please ship me Level No. .... It is understood that after thoroughly testing this level, if it fails to come up to your representations, I have the privilege of returning it to you within five days, carriage collect. Otherwise I will keep and pay for it.

Name.....  
Address.....



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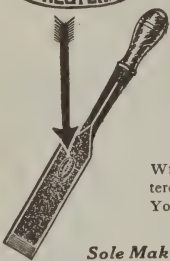




## April Bargain

Clark's Expansion Bit, with 2 cutters (will bore hole from  $\frac{1}{8}$  to 3"), and 6-ft. "Zig Zag" rule—both for \$1.00; charges prepaid. Free—write today for big free hardware bargain book No. 7.

**Cobb, Whyte & Laemmer Company**  
Dept. 7 177-179 N. Clark St., Chicago



## What the Sterling Mark is to Silver—

the BARTON trade mark is to Carpenters' Tools—the highest in quality and the highest in price.

Write for book "True Stories" and an interesting article on how our tools are made. You'll know then why our tools cost more.

**Mack & Company**

Sole Makers Brown's Race, Rochester, N.Y.

## Estimators' Price Book and Pocket Companion

By I. P. HICKS

Second Edition, revised and enlarged. Over 180 pages. A guide to prices of all kinds of building materials, with handy rules, tables and miscellaneous information for the estimator.

PRICE, POSTPAID, \$1.00

**Hodgson Book Co.,** 537 South Dearborn St. CHICAGO, ILLINOIS

1853

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**BUCK BROS.**



**61 Years of Tool Making Behind Buck Bros. Products**



Our line of tools includes Gouges, Plane Irons, Chisels, Drawing knives, Nail Sets, Screw Driver Bits, Carving Tools, etc. Our reputation guarantees them all. Catalog shows them all. Write for it.

**BUCK BROS. : : MILLBURY, MASS.**

## Con-Ser-Tex Canvas Roofing

No part of any building receives harder wear than the roof. And a flat porch roof receives about the hardest wear of any, as it is frequently walked on and various articles of furniture, etc., are left standing on it. The first idea of the roof is to shed the rain which falls upon it, but at the present time a roof cannot be limited to this one purpose.

The Wm. L. Barrell Co., 8 Thomas St., New York, in manufacturing Con-Ser-Tex Roofing for porch roofs, piazza floors, decks on boats and similar places where hard usage and exposures of the weather both act upon it have considered carefully the various problems in connection of roofing of this character. Con-Ser-Tex Roofing therefore, possesses unusual wearing qualities while it is also absolutely weather proof.

Con-Ser-Tex Roofing is made in several weights and widths and as usually made is processed in such a manner as will not also be waterproof but it will preserve the cotton fibre from mildew and similar destructive agents. The Wm. L. Barrell Co. believe that our readers will be interested in receiving samples of the various weights of Con-Ser-Tex Roofing and are therefore prepared to send them to our readers on request their sample book A-1, which contains samples of Con-Ser-Tex Roofing and also their circular giving instructions to lay as well as various other information regarding it.

## The Builders' Transit

Those of our readers who have followed the articles on "Engineering for the Contractor" will realize the value of a transit in their work. Among the numerous styles made the one made by F. Weber & Co., St. Louis, Mo., and described in their catalog No. 300 N. B., is of especial interest. This transit is designed especially for builders and is equipped with all the adjustments necessary to do any of the work which the builder encounters.

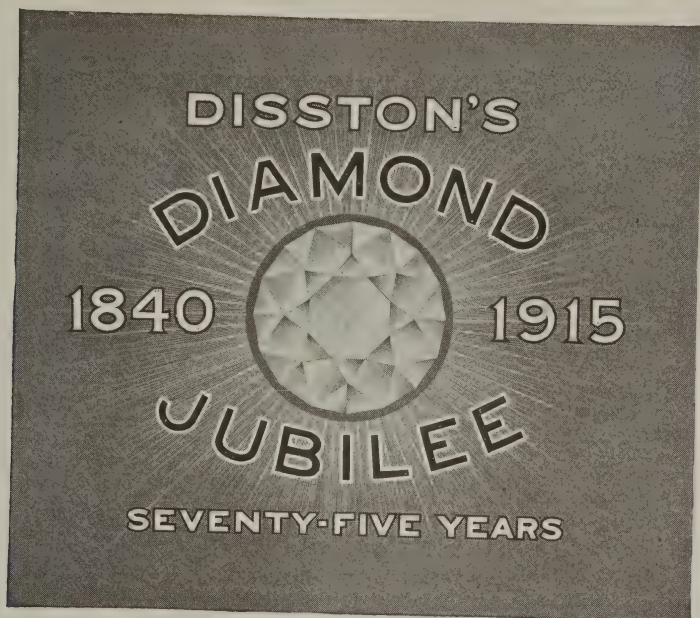
The main feature of contracting today is accuracy and this can only be secured by the use of instruments which are accurate in themselves. This is one of the strong points of the Weber Transit as the instrument gives a reading as close as one minute.

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This book is thoroughly original; every cut is new and specially made for it. One new feature which will commend itself to mechanics is the absence of reference letters on the illustrations, therefore the reader will have no trouble in looking for the various A, B, C's, etc., which are sometimes confusing to beginners.]

One of the many books for carpenters for sale by

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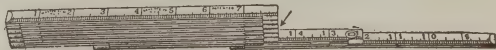
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Catalog No. 300 N. B. also contains a very complete list of drawing materials and instruments, drawing tables, supplies, tapes, books and other items of interest to the contractor.

### The Plant of the Sykes Metal Lath & Roofing Co.

Our readers will be interested in seeing this view of the new plant of the Sykes Metal & Roofing Co., at 502 River Road, Warren, Ohio. This plant has just been completed at a cost of about \$500,000, and is devoted exclusively to sheet metal products. The plant employs something over

a success of it. He is apt to skimp too much of the work and not get the rest of it any too good. It really requires a good man to do a good job of repairing, and so the man who goes at it in the proper spirit is pretty sure to get into a very good business. Just as soon as the community learns that there is a conscientious jobber around he will be pretty sure to be kept busy all the time.

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The \$500,000 Plant of the Sykes Metal Lath & Roofing Company

500 men and the Sykes Co. not only believe that the coming years will be good ones in the Metal Lath and Roofing Industry but they have gone further and prepared to meet the demand which they feel certain is coming.

One of the products of the Sykes Metal Roofing Co. is their Expanded Cup Metal Lath, a sample of which they are anxious to send to every one of our readers, together with their free specification book on Metal Lath. This sample will show the reader the good features of the Lath while the specification book will inform him regarding its application and use.

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beams full of rusty nails. He must have tools just for this. On the other hand, he must not expect to do high grade work unless his tools are in first class condition.

One of the jobs which comes to the contractor at frequent intervals in repairing old buildings consists in raising the floors or other parts of the building back to their original position after they have settled or shrunk out of place. To do this requires some form of a jackscrew having suitable lifting power and yet not being awkward to use. The Batavia Clamp Co., 195 Center St., Batavia, N. Y., have had so many demands for a jack of this character that they have devised a special one just for the busy contractor. It is essentially an automobile jack, being of light weight, but having a lifting capacity of a ton. This will be enough for any ordinary small job



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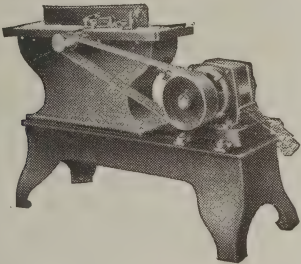
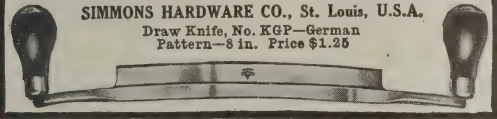
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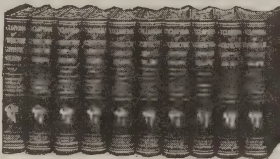
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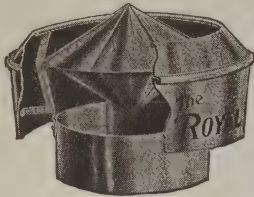
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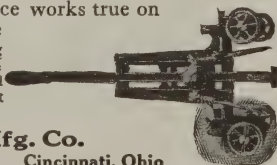
The woods and the fillers used are described at length and directions are given for ordinary filling, for finishing and fuming oak, for veneer work, and for French polishing. Stains and staining constitute an important division of the manual, and a wealth of practical formulae is presented. Varnishes, their make-up, tests and uses, is another capably handled branch of the subject. Instructions for renovating old furniture and on the treatment of stains and spots brings to a conclusion a very useful exposition of an important art.

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while a number of them will take care of quite an elaborate alteration.

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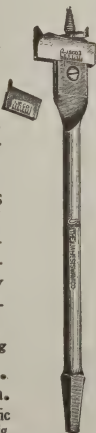


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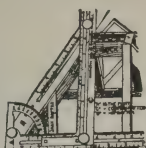
One of the greatest objections to the use of Stucco has been the fact that the color was not pleasing to many owners. Other objections were due to the natural qualities of Portland Cement. These objections have been more or less overcome in various ways but it has remained for the Woodville Lime & Cement Co., 1300 Nicholas Bldg., Toledo, O., to prepare a Stucco combining the necessary constructive features with the artistic appearance desired by the leading architects.

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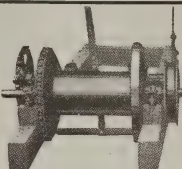
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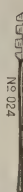


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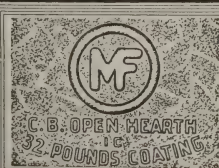
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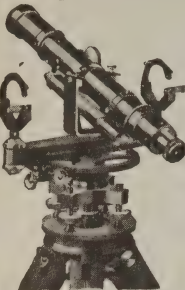
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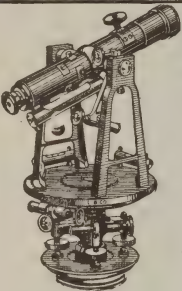
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or stamps. I will credit the \$1.00 on your first order for plans. Complete blue print drawings, working details, specifications, and list of material at reasonable prices. (Also plans from your own ideas.)

JENS C. PETERSEN, Architect  
820 State Bank Bldg., Traverse City, Mich.

Convertible WYE Level

For Architects and Contractors. 12-inch Achromatic telescope, cross hairs, sunshade and cup. Clamp and tangent to vertical axis, horizontal circle to degrees, by vernier to 5 minutes; tilting arrangement as shown. Will hold adjustments. Price \$57.50. Leveling rods, measuring tapes, etc.



Good bargains in second hand instruments in perfect working order. Instrument Repairing—good workmanship, low prices. Send instruments for estimates. Ask for catalog 300 N. B.

F. WEBER & CO.

St. Louis, Mo. PHILADELPHIA Baltimore, Md.

the different sizes of lumber and is indexed so that one can turn to the right page instantly. A thumb index on the edge allows one to pick out the right page both for the given size and for the number of pieces required. The Reckoner is bound in cloth and can be carried in the pocket if desired. It is interesting to note that the book is now in its 7th edition, thus indicating its popularity.

Home Made Acetylene

The fact that many of our readers are erecting buildings equipped with acetylene lighting indicates the satisfaction which this form of gas is giving. Acetylene is a peculiar preparation, being an exceptionally pure gas made by mixing calcium carbide with water. The gas in itself has a strong pungent odor but is not poisonous to breathe so there can be no danger from its use, or rather from its abuse, in this particular.

As near as we can determine there are over a quarter of a million acetylene gas plants in daily use, and the number is rapidly increasing. To provide sufficient material to keep all of these in operation the Union Carbide Sales Co., Dept. 27, 42nd St. Bldg., New York City, has perfected a sales plan by which everyone can be kept supplied. They have also prepared literature showing the best way to make acetylene for country home use and for isolated plants and how to use it for cooking as well as lighting. Our readers can obtain this literature on request from the Union Carbide Sales Co., at the above address and it will give them valuable talking points to use when approaching the farmer or the owner of a country place with a view of installing a lighting and cooking fuel plant.

An All Steel Coal Chute

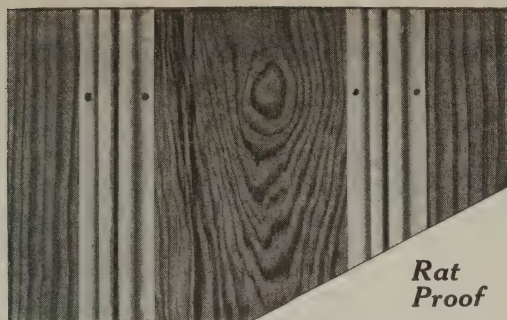
The contractor is interested in the Kewanee All Steel Coal Chute because it means a profit to him when he installs it and it means a satisfied owner knowing there is no glass to be broken, frames or sills to be damaged. The coal-man is pleased too, because he knows that he cannot go way and leave it unlocked nor can he be blamed for any damage; the coal chute opens so easily too that there is no delay in getting the coal in. The Kewanee

Advertisers' Section.

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ON LETTERS YOU  
TISERS. IT HELPS.



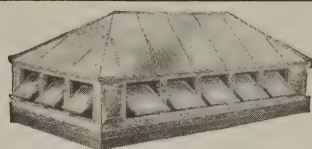
**Rat  
Proof**

## Metallic Batten Strips For Barn Siding

And other buildings where vertical siding is used. These Batten Strips expand and contract with siding; no warping, splitting or drawing off. Metallic Batten Strips make the building wind, rain and snow proof, always lay flat, do not interfere with sliding doors and add to the beauty of the building.

*Write for prices and free samples*

**Metallic Batten Company, Department M, Owensville, Ind.**  
Canadian Representative: **Taylor Mfg. Co., Hamilton, Ont.**

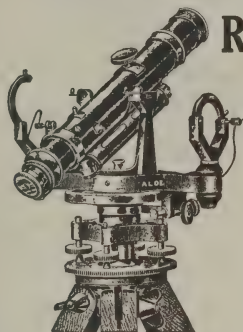
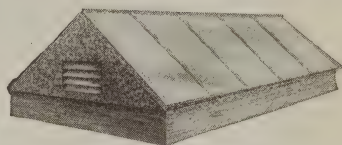


## All Kinds of WILLIS Skylights

are shipped to building contractors for erection on all buildings from residences to factories. Gives maximum amount of light and ventilation. Greatest durability, largest glass area, guaranteed watertight, easily put together. The above is true of *all* Willis Skylights.

Learn more about them—and about the most complete line of Architectural Sheet Metal Work on the market—by writing on your business stationery for the 180-page Willis catalog. It costs you nothing.

**Willis Mfg. Co., Galesburg, Ill.**



## Rent This Level 10 Months, Then It's Yours

**Builders — Contractors** — This is not the old style Architect's Level. It is the newest 1915 model **convertible** level. There is not a single Builder or Contractor who has not almost daily need for this instrument. For laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning shafting, walls, piers, etc., for getting angles, locating levels anywhere, ditching, laying streets and walks, running straight lines, and a hundred other uses.

### Instruction Book Free

Complete illustrated booklet telling how a builder or contractor can use the convertible level sent free on request.

### Send Coupon—No Obligation

Send the attached coupon today and we'll send illustrated booklet and complete details of how you can own the Aloe Convertible Level for 10 months' rent.

**A. S. Aloe Co., 613 Olive St., St. Louis, Mo.**

### Warning

The Level we offer is the Aloe Convertible Level. Don't confuse the Convertible Level with the ordinary old style Architect's Level. The only work that can be satisfactorily done with the ordinary Architect's Level is the determining of elevations. But the Convertible Level, besides its use as a level, is a modified "Transit" and broadens the use of the level 100 per cent. You can't afford to buy any but the Aloe Convertible Level.

### Half Century Reputation

We have been manufacturers of transits and levels since 1863 and our instruments are the standard of the world.

### Free Trial

We allow you to convince yourself by a trial of the instrument before you obligate yourself.

### The Rent Buys It

No large cash outlay needed. Just pay the monthly rent for a few months and the instrument automatically becomes your property.

### COUPON

A. S. Aloe Co.  
613 Olive St., St. Louis, Mo.

Please send free instruction book on the use of the Convertible Level and complete details of your rental plan. This request in no way obligates me.

Name .....  
Occupation .....  
Street .....  
City ..... State .....

National Builder, April, 1915

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ON LETTERS YOU  
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Mfg. Co., Kewanee, Ill., manufacture the Kewanee All Steel Coal Chutes and have a special proposition to our readers which they will make to them on request. Briefly we may say it concerns the installation of the All Steel Coal Chutes, All Steel Wagon Chutes, and the Kewanee Out Door Sleeping Berth. The latter is exceptionally attractive to those who feel the need of plenty of fresh air.

### How to Concrete in Cold Weather

An entirely new discovery has enabled the laying of concrete in cold weather without the usual methods resorted to of covering with straw or canvas, heating waters, keeping fires, etc.

This mixture is the invention of an eastern inventor and great things are claimed for it. Following is a letter from one user in Boston, Mass.:

"Lansing Co.,  
Lansing, Mich.

Gentlemen:

Replying to yours of the 19th in relation to 'Frostproofing.' Will state we have used this on a fireproof garage which we built for ourselves late last fall and in freezing weather. We put on a reinforced concrete roof, using 'Frostproofing' as directed. The following day we trowelled and finished the roof without the concrete freezing.

The temperature did not go below 20 at the time we started to pour the concrete, but we had a very severe snow-storm within a few days after the job was finished and the snow laid on the roof for two or three weeks. When it was cleared we found the roof to be in the same condition as it was before the snow-storm, which was perfectly satisfactory.

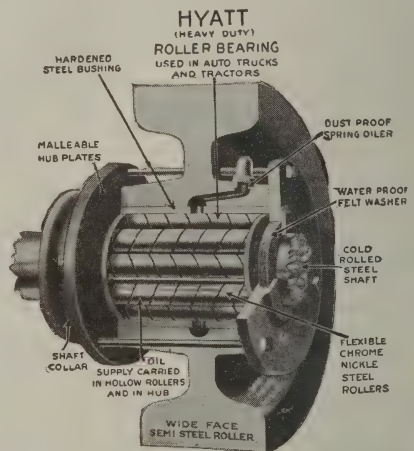
Yours truly,

W. A. HURTFELDT Co."

The Lansing Company, 1001 Cedar St., Lansing, Mich., will send to all of our readers complete data, tests, and full information on this material, and we would recommend everyone having concrete work to do to get this material for their files. "Frostproofing" is carried in stock by practically all dealers in concrete supplies, although the Lansing Co. will be glad to supply direct any one who has difficulty in securing the material at home.

### The Bearings of the Boss Mixer

The American Cement Machine Co., 1120 Johnson St., Keokuk, Ia., realizing the damage done to bearings by cement, sand, grit, etc., have designed their machines with roller bearings which will not only make the machine run much easier but as the bearings are fully protected will add years to their life. A cut of the roller bearing is shown herewith and it indicates the general care which is taken in the design of all their machinery by the American Cement Machine Co. It is interesting to note that even when the machine is running constantly it only requires oiling once a week. Moreover the bearings, being known as the Flexible Heavy Duty



Roller Bearings Used in the American Mixer

Type, absorb practically all of the shock which comes from the dumping of the concrete and so adds life to the entire outfit.

The American Cement Machine Co. make a small machine especially adapted to a batch in which just one bag of cement is used. This is a particularly desirable size as it saves measuring the cement while the measuring of the sand and aggregate is readily done by wheelbarrow loads. A convenient attachment to this mixer consists of a hoisting drum, enabling the contractor to readily raise the concrete to any desired height. This will be found especially advantageous in such work as silos, chimneys, high walls, etc., where the expense of building an ordinary scaffold is too much for the size of the job.

The American Cement Machine Co. have branches in all the principle cities in the United States and Canada where it carries



## Efficiency First!

—then appearance—durability—ease of installation—low prices—satisfaction to building owners.

## Willis Ventilators

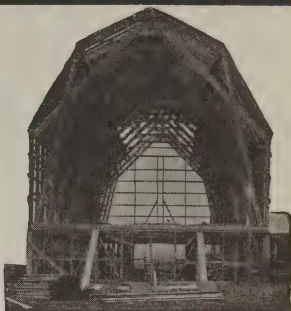
are for those building contractors who want their customers to have the most practical ventilation system, whether for a barn church, school or other building, for a reasonably low cost.

Incidentally—Willis Ventilators are good profit producers for men who install them. Get the 180-page Willis catalog.

**WILLIS**  
Manufacturing Co.  
Galesburg, Illinois

## Helpful Ideas On Dairy Barn Building Free!

If you learn more about the *newest, best, most economical* and most *sanitary* methods of Dairy Barn Construction — you will make more money. Our free book, "Building the Dairy Barn," tells about 'proved principles that it will pay you to know about. It tells facts about plank frames; King System of ventilation; proper width and arrangement; lighting; stable floors; site; size; appearance; design; drainage; and sanitary barn equipment with floor plans.



### Special Blue Print Offer

We have complete blue prints, specifications, floor plans and lumber bills for several different types and sizes of modern dairy barns. Ask about them. Also ask how to get the free help of our Architectural Department.

**James Mfg. Co.**  
C.R. 102 Cane St.  
Fort Atkinson, Wis.

## Harris Barn Equipment



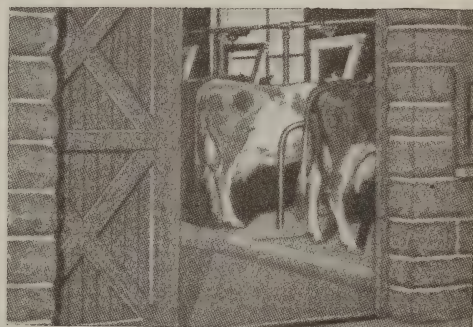
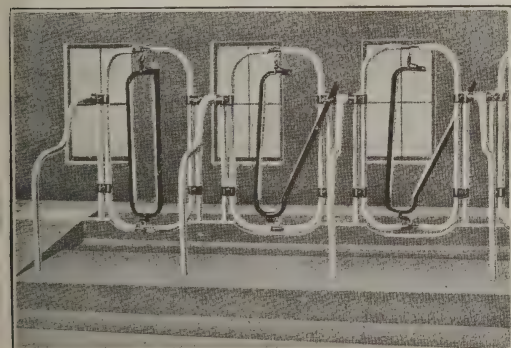
Let the HARRIS line bring you profitable barn equipment business; it **will do it!**

Your farmer customers will spend freely to get **good** equipment; you can **satisfy** them with HARRIS products.

Our No. 50 Adjustable Frame Stall illustrated below is typical of HARRIS quality and simplicity of operation.

Write today for our 56-page catalog, which describes the **most complete** line of barn equipment on the market.

**Harris Mfg. Co., Box 167, Salem, Ohio**



## Answering the Stable Question Right Means Bigger Profits for the Contractor and Builder

Every Mullins stable job is a good ad for the contractor who specifies and installs it.

Get our folder "Answering the Stable Question" now. Shows full line of stanchions, stalls, mangers, gates and feed fixtures and also Mullins Automatic Water System. All easiest to install by the contractor.

**Mullins Mfg. Co. - Brillion, Wisc.**

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machines for prompt shipment and we suggest that every contractor get their catalog containing illustrated specifications, prices, freight rates, etc. This catalog describes not only the mixers and hoists but their new Mortar and Plaster Mixer which is a great labor saver for stucco work and plaster as well as mortar for masonry.

### Beaver Board and Its Uses.

There are very few people who do not appreciate good taste in fitting up a house or a room. Any unusual wall treatments immediately attracts the attention of every one and in consequence the wall finish must be at least as good as the average or it will attract unfavorable comment.

For many years the plastered wall has been the standard by which all wall surfaces, ceilings, etc., were measured. True there are several kinds of plaster finish from the old fashioned line and hair to the Keene Cement wainscot, from the finely polished surface to the roughest sanded finish.

But none of these plaster surfaces were really finished in themselves, they required paint, calcimine, paper, burlap and various other materials to make them really finished. It was not therefore a plastered wall but the burlap or other finish which was seen. Moreover the plastered walls required considerable preparation, it requires a backing of lath, and can only be erected at the expenditure of considerable time, money and material. It is more or less at the mercy of the elements and requires good weather to permit its erection. Even then the slightest lapse on the part of the mechanic means an uneven and unsightly wall with possibly cracks and fallen plaster.

When the Beaver Board Companies, 661 Beaver Road, Buffalo, New York, began the manufacture of Beaver Board there was considerable misapprehension among the builders as to its practical utility. The enormous amount which has been used, however, with complete satisfaction, is excellent evidence regarding its quality and its ability to stand the hard service to which it is frequently subjected.

Beaver Board is a pure wood fibre wall board, used on both walls and ceiling. It takes the place of lath and plaster and

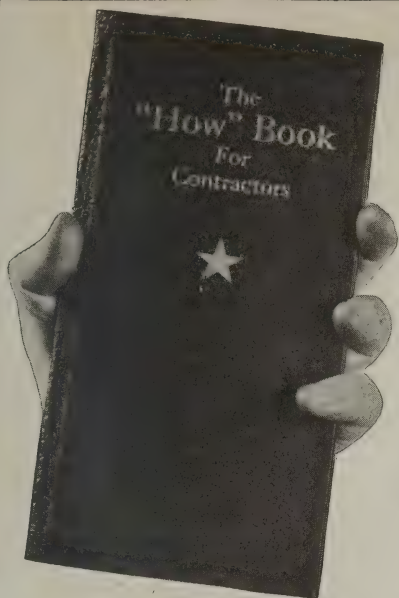
has a surface admirably suited for painting or decorating, thus making wall paper entirely unnecessary. The nature of Beaver Board is such that it is as well suited for remodelling and temporary work as for the finest permanent work. As there is nothing in it to freeze in the winter or melt during the hottest summer, it can be applied at either time with perfect satisfaction. Being in large sheets and impervious to the weather it makes a room warmer than any plaster wall could.

A great many contractors and builders have an idea that Beaver Board is adapted only to temporary use for use in attics and other places where the finest finish is neither expected nor desired. The booklet of the Beaver Board Companies disprove this idea as it shows a large number of the finest residences, hotels, stores, offices, etc., in which Beaver Board has been used.

The Beaver Board Companies have gone to considerable expense in getting up numerous artistic ideas for the contractor. Many of these ideas are given in the booklet "Beaver Board and Its Uses" which will be sent to our readers on request.

### Huberizing in Building

As a general principle the great majority of the American people insist on being sure of what they are going to get before they buy. With a reliable concern this is a distinct advantage and with a questionable one it forms a sure safeguard to the consumer. Confidence is readily established however, as soon as one finds in dealing with a reliable concern that their individual ideas are given careful consideration. The Huber Builders Material Co., 39-43 Vine St., Cincinnati, O., have a well established reputation for filling every order entrusted to them in a most conscientious manner. The Huber Company have an unusual claim on the contractor as they can supply practically everything required to complete the building and they can thus save the contractor by including all of these materials in one shipment. Our March issue contained a most interesting advertisement of the Huber Builders Material Co., interesting from the fact that it listed practically everything which could be required on the ordinary building. Not only were the various items



# How To Make More Money Building Barns!

## The "HOW" Book for Contractors and Details of Our Co-operation

Write us to-day—send us the names of folks in your section who are going to build new barns—remodel old ones or install concrete floors and we'll send

you by return mail free of all cost our 126-page, Keratol Leather Bound, Pocket Size "How" Book for Carpenters and Contractors (detailed description below) and full detail of how our Architectural Department co-operates and helps you make more money building barns.

We are the largest firm in America engaged in the manufacture of modern barn equipment and our thousands of dealers, innumerable satisfied barn owners, big and aggressive sales force, drafting department, in fact, our entire organization get back of you the minute you ask us to co-operate.

And our services are free to you—don't cost one penny but are worth big money.

Write for the "How" Book and details of our co-operation.

## Description of the "HOW" Book

126 pages. Pocket size. Bound in durable Keratol leather. Packed from cover to cover with information that saves the contractor time and money.

## Pocket Size Encyclopedia

It tells how to figure life, strength and quantities on all kinds of building material. Safe loads—bending stresses—crushing strength—timberweight—waste—shrinkage—roof pitches—labor costs in roofing, carpentry and masonry work, etc. Ready reckoner, too—all compiled from authoritative sources. A wealth of practical, usable every-day information that you as a carpenter and contractor can't afford to be without.

## Hunt, Helm, Ferris & Company

340 Hunt Street, Harvard, Illinois

### Free "How Book" and Blue Print Offer

HUNT, HELM, FERRIS & CO.,

340 Hunt Street, Harvard, Illinois

Send me free of all charges, 126-page, Keratol Leather Bound, Pocket Size "HOW BOOK" and details of your FREE BLUE PRINT SERVICE and co-operation. Enclosed find a list of folks in my vicinity who expect to build new barns, remodel old ones or put in concrete floors this spring.

Name.....

Post Office.....

R. F. D..... State.....

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WRITE TO ADVER-



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shown, but the prices were also given, thus enabling the contractor to readily compare with others or to order without further correspondence. We find that many of our readers have already taken advantage of this method of obtaining materials for the buildings which they have under construction.

### Floor Scraping

The increasing use of not only hardwood floors but of the finer grades of parquetry and mosaic floors calls for the highest grade of finish in this part of the work. There is not a whole lot of difference between the actual material, but there is a great difference in the final appearance depending upon whether or not it has been carefully scraped and finished.

There are a great many makes of floor scrapers on the market and one wonders sometimes how they all manage to do their work. The Fox Floor-Scraper has an enviable reputation for being free from many of the defects which are found in others and for doing the highest grade of work. Department N of the Fox Supply Co., Brooklyn, Wis., has an interesting booklet showing the numerous points of Fox superiority and they are anxious to send this booklet to those of our readers who lay and appreciate good hardwood floors.

The Fox Floor Scraper is made for use on both old and new floors and is designed to do any of the work which a floor man is called upon to do. The prices which the Fox Supply Co. have quoted to our readers at this time seem to be most attractive and well worth considering.

### Nickerson Columns

Catalog No. 4 of the Nickerson Mfg. Co., Knoxville, Tenn., is extremely interesting to the contractor who has ever erected porch columns. The catalog shows the detail of the Nickerson Patent Double Lock Joint by which it is impossible for the staves of the built up column to ever come apart or work loose. The care spent in making this Lock Joint is only one feature of the Nickerson process, every step in the construction being designed to produce only perfect work.

Not only in the actual construction but in the detail of design the Nickerson col-

umns have reached a high standard. The accepted architectural details are faithfully followed for their stock designs, while they are in a position to faithfully reproduce any special details, mouldings, etc., which the architect may desire.

The Nickerson Mfg. Co., are also large manufacturers of interior trim, both in the standard sizes and styles and in special work for the most critical customer. A careful study of their catalog will indicate why it is advisable to consult with them regarding prices, etc., for columns, grills, mantels, and trim both exterior and interior. Their catalog will be sent to our readers on request.

### Expanded Metal Construction

The March issue of Expanded Metal Construction published by the North Western Expanded Metal Co., 905 Old Colony Bldg., Chicago, contains a number of interesting examples of buildings on which XX Century and Kno-Burn were used for interior and exterior construction. The buildings shown are from the offices of the leading architects of Washington, Philadelphia, New York and Baltimore.

It will be found that the architects who are the most critical with regard to materials will be found to be using the products of the North Western Expanded Metal Co. extensively. This means that they have investigated the subject thoroughly and are convinced that it will not only be satisfactory in matter of construction but economical in price and bring credit to themselves and the contractor.

"Expanded Metal Construction" is published every month and we understand that contractors and others actively engaged in building construction can have their names placed on the mailing list free of charge by writing to the North Western Expanded Metal Co. at the above address. Also ask for Booklet 51.

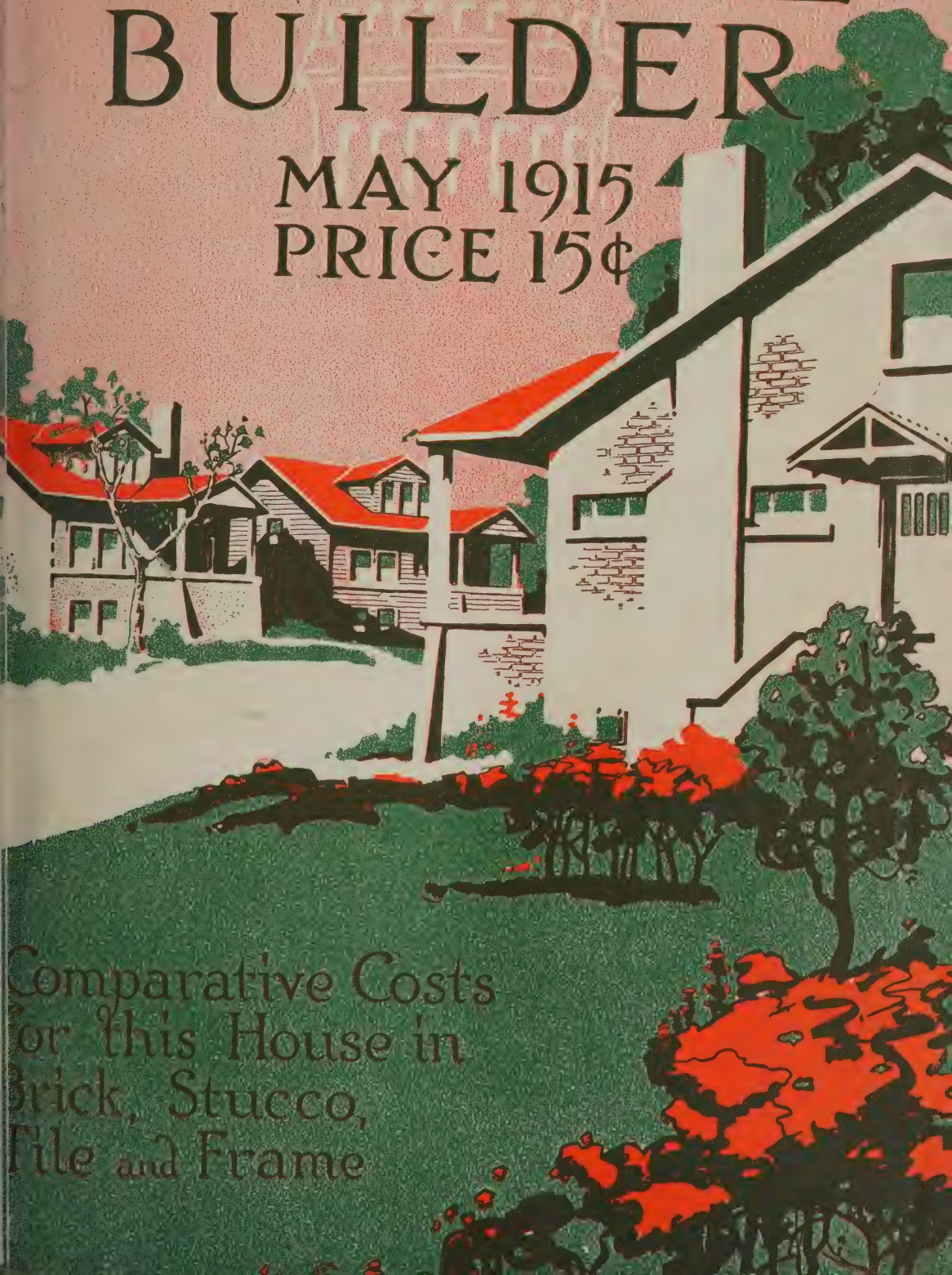
"Lock your Plaster to Your Walls" is the heading on a neat circular, sent out by the North Western Expanded Metal Co., which shows some of the practical tests made on North Western Materials. The circular is particularly interesting as showing the weather proof, fireproof and damage proof qualities of Kno-Burn Metal Lath.



NA Farm needs

# THE NATIONAL BUILDER

MAY 1915  
PRICE 15¢



Comparative Costs  
for this House in  
Brick, Stucco,  
Tile and Frame



# Do 9 Things With One Machine

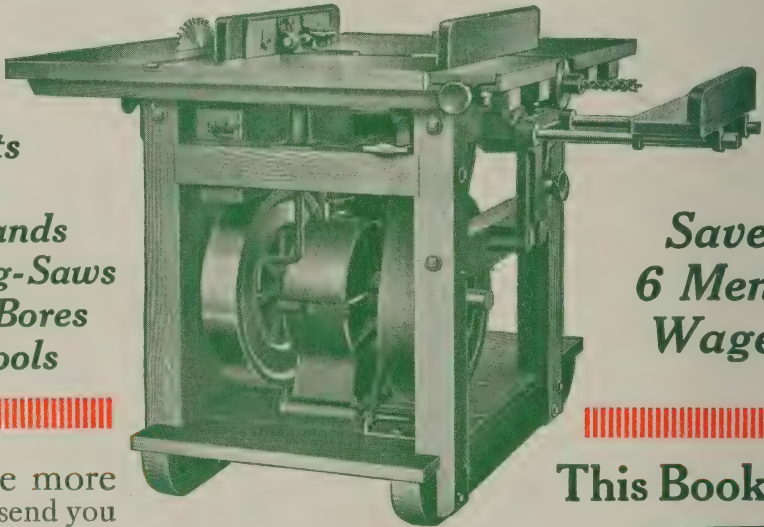


It was like gilding refined gold to put the positive Oshkosh Belt Tightener on the "Eveready Saw Rig," but we did it. If this wonderful machine was perfect before it is more so now. Needn't shut off the power to change the

## Eveready Saw Rig

tools at all. Just move a handle and the head stops. Change the tool you wish. Move it again and "she's off." It has added much to the time efficiency of this greatest of machines. We will gladly tell you all about it.

*Cross-Cuts  
Rip-Saws  
Joints, Sands  
Mitres, Jig-Saws  
Grooves, Bores  
Grinds Tools*



*Saves  
6 Men's  
Wages*

We will be more than glad to send you a copy of the comprehensive Oshkosh Book which will tell you more about Oshkosh Saw Rigs and Concrete Mixers than we could put in many pages of this publication. It pictures everything and it gives you the experiences of men who have been using Oshkosh machinery for years. A postal will bring it.

**This Book Free**

**Oshkosh Manufacturing Company**  
414 So. Main Street, Oshkosh, Wisconsin



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# THE NATIONAL BUILDER

Vol. 57 (51st Year) Chicago, May, 1915 No. 5



A Brick Residence Built in Chicago.

**NATIONAL BUILDER DESIGN No. 395**

**L. E. Russell, Architect, Chicago**

For Floor Plans, Elevation, etc., see Double Supplement of this month

**Estimated Costs,**

Brick .....	\$4,595.35	Frame with Stucco.....	4,067.45
Tile with Stucco.....	4,065.35	Frame with Siding .....	3,875.95

## Estimate of a Brick Residence

*I. P. Hicks*

EXCAVATING			
180 yards excavating, 35c.....	\$ 63.00	4 cellar window sills, single,	
		\$1.50 .....	6.00
MASONRY		2 cellar window sills, double,	
1,020 cubic ft. concrete in founda-		\$3 .....	6.00
tion, 25c .....	\$ 255.00	6 cement steps, side entrance.	10.00
5 cement steps .....	8.50	9 window sills, single, \$1.50..	13.50
		1 window sill, double.....	3.00
		2 door sills, \$3.....	6.00

\*Materials are figured at Omaha prices. Car-penter labor figured at 50 cents per hour.



Chimney cap .....	3.00
1 chimney block .....	.75
75 square ft. reinforced concrete floor, 25c .....	18.75
60 lineal feet coping, 70c.....	42.00
15,000 press brick laid in face wall, \$35 .....	525.00
40,000 common brick laid up in wall, \$13 .....	520.00
18 square yards cement plaster, \$1.25 .....	22.50
972 square ft. concrete cellar... floor, 12c .....	116.64
33 lineal ft. chimney, \$2.25.....	74.25
400 square ft. cement sidewalk, 11c .....	44.00
Catch basin.....	15.00
Drain laying .....	56.00
<hr/>	
Total .....	\$1,745.89

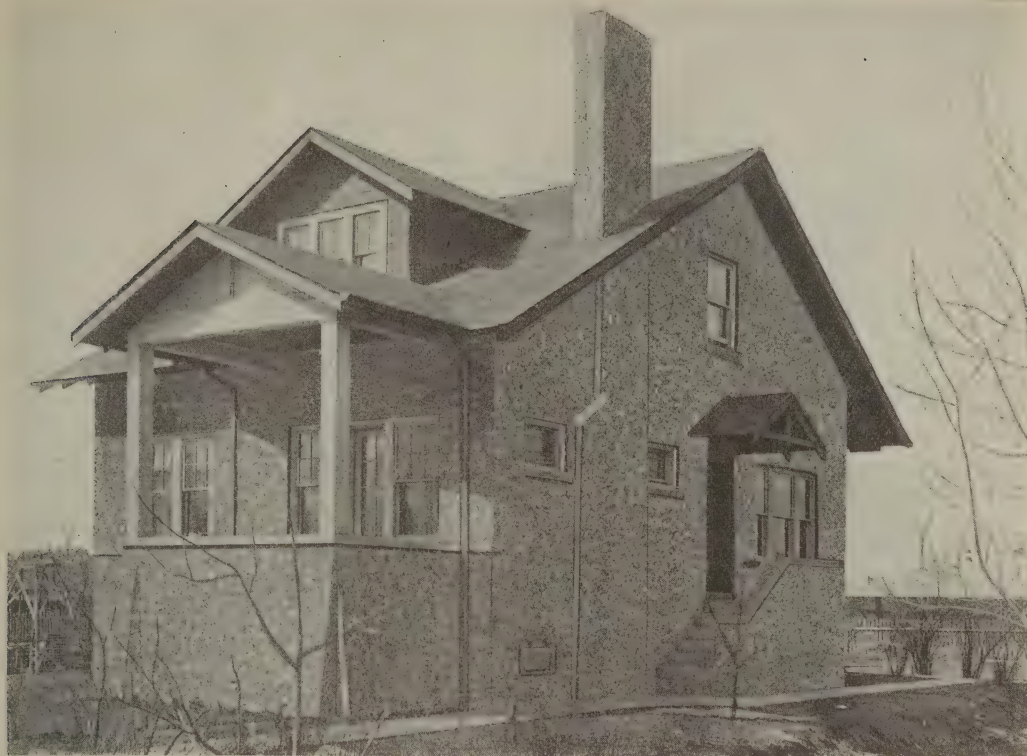
LUMBER BILL		Feet
1 6x8x16 ft. girder .....	64	
1 6x8x24 ft. girder .....	96	
2 6x6x16 ft. posts .....	96	
12 2x4x16 ft., for coal bin.....	132	
32 2x10x12 ft. first floor joists.....	640	
28 2x10x14 ft. first floor joists .....	645	
32 2x8x12 ft. second floor joists.....	512	
28 2x8x14 ft. second floor joists ....	432	
5 2x8x12 ft. porch .....	80	
3 2x8x16 ft. porch beams .....	63	
6 2x6x12 ft. porch ceiling .....	72	
14 2x6x10 ft. porch rafters .....	140	
24 2x4x16 ft., for dormers .....	264	
6 2x8x10 ft. rear porch .....	81	
60 2x4x18 ft. first story partitions..	720	
6 2x6x18 ft. first story partitions..	108	
50 2x4x18 ft. second story partitions	600	
4 2x6x18 ft. second story partitions	72	
16 2x4x16 ft. plates .....	176	
16 2x4x12 ft. plates .....	128	
9 2x10x16 ft. wall plates .....	243	
24 2x8x24 ft. rafters .....	768	
16 2x8x16 ft. rafters .....	336	
48 2x4x12 ft. collar beams .....	384	
24 1x6x12 ft. braces .....	144	
26 1x4x12 ft. bridging .....	104	
<hr/>		
Total ft. dimension lumber.....	7,100	

7,100 ft. framing lumber, \$25....	\$177.50
1,650 ft. No. 2 8-inch lap, rough floor, \$24 .....	39.60
100 ft. No. 2 8-inch lap, coal bin, \$24 .....	2.40

150 ft. No. 2 8-inch lap, sheathing dormers, \$24 .....	3.60
2,100 ft. No. 2 6-inch sheathing, roofs, \$23 .....	48.30
20 squares Patent Shingles, \$8..	160.00
90 ft. 1x4x12 ft. porch floor, \$40..	3.60
740 ft. 5/8x4"x12 to 16 ft. ceiling cornice, \$28 .....	20.72
4 2x8x14 ft. finish verge boards, \$46 .....	3.31
2 2x8x16 ft. finish verge boards, \$46 .....	1.93
2 2x8x10 ft. finish verge boards, \$46 .....	1.20
3 1 1/8x12x12 ft. finish porch steps, \$42 .....	1.89
4 1x8x12 ft. finish for porch, \$46 .....	1.47
8 1x10x12 ft. finish for porch, \$46 .....	3.68
3 1x8x12 ft. finish for porch, \$46 .....	1.10
20 1x6x12 ft. finish cornice, \$42..	5.04
10 1x4x12 ft. finish cornice, \$42..	1.26
8 1x12x12 ft. finish for shelves, \$40 .....	3.84
1 1 1/8x12x12 ft. finish for pantry, \$40 .....	.60
1,888 ft. 7/8x2 1/4 face clear flooring, \$40 .....	75.52

Total lumber bill.....	\$556.56
------------------------	----------

MILL WORK	
2 10x10x8 ft. porch posts, \$2....\$	4.00
1 piece porch rail, bottom, 14 ft., 5c .....	.70
1 piece porch rail, bottom, 6 ft., 5c .....	.30
1 piece porch rail, top, 14 ft., 5c ..	.70
1 piece porch rail, top, 6 ft., 5c ..	.30
60 balusters, 1 3/4x1 3/4x20 inches, 4c	2.40
1 large bracket .....	1.60
3 beam corbels, 75c.....	2.25
4 porch newels, 50c .....	2.00
220 ft. 3 1/4-inch crown mold, 1 1/2c..	3.30
340 ft. 2-inch bed mold, 1 1/4c.....	4.25
1 cellar window frame, 30x14, 2 lt. ....	2.00
2 cellar window frames, 24x14, 2 lt., \$1.75 .....	3.50
1 cellar window frame, 32x14, 2 lt. ....	2.00
2 twin window frames, 26x14, 2 lt., \$4 .....	8.00



The Residence as it Appeared with Stucco Finish.

1 cellar window frame, 34x14, 2 lt. ....	2.25	2 window frame, 22x20, 2 lt., \$2.60 .....	5.20
1 cellar window, 30x14, 2 lt. ....	1.45	1 window frame, 36x24, 2 lt. ....	3.00
2 cellar windows, 24x14, 2 lt., \$1.15 .....	2.30	2 mullion frames, 3 windows, 18x 40, single sash, \$6 .....	12.00
1 cellar window, 32x14, 2 lt. ....	1.50	4 windows, 26x26, top sash di- vided, \$1.75 .....	7.00
4 cellar windows, 26x14, 2 lt., \$1.30 .....	5.20	1 window, 28x26, top sash di- vided .....	1.85
1 cellar window, 34x14, 2 lt. ....	1.50	2 windows, 22x20, 2 lt., \$1.35 ....	2.70
1 cellar door frame, 2-10x6-8 ....	3.00	1 window, 24x20, 2 lt. ....	1.45
1 cellar door frame, 2-6x6-8 ....	2.80	1 window, 18x24, 2 lt. ....	1.30
1 cellar door, 2-10x6-8x1 $\frac{3}{4}$ ....	4.00	1 window, 32x26, 2 lt., top sash divided .....	2.60
1 cellar door, 2-6x6-8x1 $\frac{3}{8}$ ....	2.60	2 sashes, 32x16, divided, 90c ....	1.80
1 front door frame, 2-6x7-0, with side windows, 26x26, 2 lt. ....	8.00	2 windows, 34x26, 2 lt., top sash divided, \$2 .....	4.00
1 side door frame, 3-0x7-0 ....	3.00	1 window, 32x24, 2 lt., top sash divided .....	1.80
1 rear frame, 3-0x7-0, with side window, 28x26, 2 lt. ....	6.00	1 window, 36x24, 2 lt., top sash divided .....	2.10
1 window frame, 24x20, 2 lt. ....	2.50	6 sashes, 18x40, divided, \$1.40 ..	8.40
1 window frame, 18x24, 2 lt. ....	2.25	1 front door, 2-6x7-0x1 $\frac{3}{4}$ ....	12.00
1 window frame, 32x26, 2 lt. ....	2.65	1 side door, 3-0x7-0x1 $\frac{3}{4}$ ....	10.00
2 sash frame, 32x16, \$2 .....	4.00	1 rear door, 3-0x7-0x1 $\frac{3}{4}$ ....	10.00
1 twin frame, 26x26, 2 lt. ....	5.20		
1 twin frame, 34x26, 2 lt. ....	6.00		
1 window frame, 32x24, 2 lt. ....	2.90		



1 vestibule door, 3-0x7-0x1¾	12.00
2 doors, 2-8x7-0x1¾, \$6	12.00
2 doors, 2-6x7-0x1¾, \$6	12.00
3 doors, 2-4x7-0x1¾, \$5	15.00
3 doors, 2-8x6-6x1¾, \$3	9.00
1 door, 2-4x6-6x1¾	2.50
1 set door jambs, 3-0x70	.90
2 sets door jambs, 2-8x7-0, 80c	1.60
2 sets door jambs, 2-6x7-0, 75c	1.50
3 sets door jambs, 2-4x7-0, 70c	2.10
3 sets door jambs, 2-8x6-6, 60c	1.80
1 set door jambs, 2-4x6-6	.60
1 set jambs, C. O., 2-2x7-0	.60
2 sets door jambs, C. O., 5-0x7-0, \$1	2.00
60 Plinth blocks, 6c	3.60
420 ft. casing, 14 ft., doors, 2c	8.40
260 ft. casing, 12 ft., windows, 2c	5.20
284 ft. head casing, 2c	5.68
284 ft. cap mold, 2c	5.68
284 ft. fillet, 1½c	1.42
280 ft. panel strips, 9 ft., 1c	1.40
96 ft. window stool, 2½c	2.40
96 ft. apron, 1¾c	1.68
216 ft. door stops, 7½ ft. length, ¾c	1.62
308 ft. window stops, ½c	1.54
436 ft. base, 3¼c	14.17
436 ft. floor mold, ½c	2.18
180 ft. picture mold, 1¼c	2.25
4 thresholds, 3 ft. 4 in., 15c	.60
Front stairs	42.00
Sideboard	32.00
Mantel	40.00
3 corner beads, 20c	.60
Total mill work	\$439.62

ALTERNATE ESTIMATE USING HOLLOW	
Brick walls omitted, cost	\$1,045.00
Save on painting	60.00
Save on furring	35.00
Save on lathing	25.00
Total	\$1,165.00

ALTERNATE ESTIMATE USING FRAME	
Brick walls omitted, cost	\$1,045.00
Save on furring	35.00
Total	\$1,080.00
140 ft. 2x4x14 ft.	1,260
30 ft. 2x4x12 ft.	240
Total feet	1,500
1,500 ft. dimension in outside wall	\$ 37.50
2,400 ft. sheathing, \$24	57.60

CARPENTER LABOR	
7,100 ft. dimension lumber, \$10	\$ 71.00
4,000 ft. sheathing, \$10	40.00
90 ft. porch floor, \$1.60	1.44
Porch steps	4.00
166 lineal ft. main cornice, 16c	26.56
72 lineal ft. dormer cornice, 15c	10.80
34 lineal ft. porch cornice, 20c	6.80
1,888 ft. finish, floor, \$2	37.76
14 squares smoothing floors, \$1.50	21.00
Setting frames, 27 at 30c	8.10
Finishing, 45% cost of mill work	194.42
Work around porches, etc	40.00
Furring outside walls	20.00
Total	\$371.88

THE COMPLETE ESTIMATE	
Excavating	\$ 63.00
Masonry	1,745.89
1 coal chute	15.00
Lumber bill	556.56
Mill work	439.62
Carpenter labor	371.88
Hardware and nails	64.00
Tin and sheet metal work	30.00
Structural iron (lintels and an- chors)	20.00
Plastering, 660 yds. at 27c	178.20
Gas fitting and plumbing	380.00
Electric wiring	48.00
Painting	110.00
Heating plant, furnace	150.00
Incidentals, 5%	422.20
Total estimate	\$4,594.35

TILE WALLS AND STUCCO OUTSIDE FINISH	
Tile cost	\$ 400.00
Stucco plastering, 295 yds., 80c	236.00
Total	\$ 636.00
Amount saved	\$ 529.00
Making total estimate	\$4,065.35

AND SIDING FOR EXTERIOR WALLS	
3,200 ft. siding, \$30	96.00
7 rolls R. R. paper, 50c	3.50
Carpenter labor	100.00
Painting	60.00
Nails	7.00
Total	\$ 321.60
Amount saved	\$ 718.40
Making the estimate	\$3,875.95



The Same Residence in Frame.

ALTERNATE ESTIMATE USING STUCCO ON METAL LATH FOR EXTERIOR WALLS			
Brick walls omitted, cost.....	\$1,045.00	2,400 ft. sheathing, \$24 .....	57.60
Save on furring .....	35.00	Carpenter labor .....	40.00
		Nails .....	5.00
Total .....	\$1,080.00	295 yds. stucco plaster on metal	
140 ft. 2x4x14 ft.....	1,260	lath, \$1.40 .....	413.00
30 ft. 2x4x12 ft. ....	240		
		Total .....	\$ 553.10
Total feet .....	1,500	Amount saved .....	\$ 526.90
1,500 ft. dimension in outside		Making the estimate.....	\$4,067.45
walls .....	\$ 37.50		

# How To Use This Estimate

This estimate is figured at Omaha prices, with carpenter labor at 50 cents an hour. To use this estimate for other localities the reader will note that the price of each grade of lumber, as well as all other materials, is given in the regular trade units, that is per thousand feet for lumber, per thousand for shingles, per cubic yard for excavating, etc.

It is a simple matter to substitute the prices current in your vicinity for the

prices given in this estimate and to extend the quantities and so determine the exact cost for your neighborhood.

For instance, framing lumber may be \$30 per thousand in your town while it is figured in this estimate at \$25. Simply extend the number of feet at \$30; labor may be more or less. The owner may want to contract for the furnace or plumbing separately. The detailed estimate makes these changes possible.



# What Does It Cost?

**B**UILDING A HOME is one of the most serious undertakings any man can start. From the very start there are numerous sides to the question and unless every one is settled the "Home" is more or less of a failure.

Not only must the builder consider his own needs at the time the home is built, but he must consider the needs of a growing family and a growing community. His building will influence others to build or not to build, depending on how successful he has been. He must build for the present and for the future, determining, as far as possible, what his financial and social position will be when he has the house paid for.

A new community is often productive of cheap buildings of poor construction, because the owners build only according to their present needs, not realizing that conditions may be greatly changed in a few years. They can influence these changes, they do influence them, by the character of buildings they erect.

In every community we see buildings which are positive eye-sores, because the owner did not consider all the questions surrounding his project. His one thought was to build for himself, permanently no doubt, for many of the worst appearing buildings are of the most substantial construction. As long as the building is serviceable it will probably be occupied, and will thus far outlive its neighbors where good construction was sacrificed to mere appearance.

The owner thus must consider his obligation to the neighborhood, for if he does not, the personal good qualities of his family will be handicapped in proportion to the failure of the house. There is a social distinction in building. If you don't believe it watch the flat hunters any Sunday afternoon.

Hidden values, such as extra good framing or walls, heavier joists, double floors, etc., are not always apparent in a new house, to the ordinary observer. Their presence is apparent, however, in time, and little by little even the reputation of a poorly constructed building comes out. Likewise the good construction shows in time in the freedom from repairs, leaks,

sagging doors, etc. So the owner must consider good construction also to keep up the reputation of the place after the appearance gives it a good name.

Not all buildings are meant for the same purpose and the requirements of every family may be said to be different from every other, if indeed they do not change from year to year. Good, serviceable houses are being sold every day, because they no longer meet the owner's requirements, and the new owner, in turn, may dispose of the same building again in a few years. So some consideration must be given to the suitability of the house for some one else's use some time in the future. This also tends to eliminate oddness in design and construction, and leads the architect to so plan the rooms that each may serve several purposes, depending upon the particular requirements of the owner.

It might be inferred from the foregoing that we are opposed to new things in building. Quite the contrary, provided the new things and ideas are in the line of betterment, first from appearance, second from construction and third from price. And the greatest of these is price. Say what we will, price rules, and will continue to rule in nine cases out of ten, and in the tenth will have an influence.

From time to time new materials are appearing on the market and older materials are seen in new forms. These new materials are designed to take the place of those now in use and are therefore susceptible to the same considerations. They must have the appearance, not imitation of something else, they must be permanent, not merely a temporary makeshift of doubtful strength, and they must compete in price when comparative quality is considered.

A great objection to the general adoption of new materials lies in the fact that its production is limited. It takes time to become thoroughly tested out and more time to equip factories to give anything like a general distribution. Remember how long it took Portland cement to come into general use, and that in spite of its many good qualities.



A Suburban Residence.

E. E. Roberts, Architect.

## LOCAL CONDITIONS

Building operations are influenced largely by local conditions. Where brick can be obtained at the kiln, a considerable saving is made and it is only natural that many brick buildings should be the rule in that vicinity. In the woods where lumber can be had for the cutting, one naturally expects to find frame construction predominating. Other localities favor the use of cement blocks. Some semi-fashionable houses are of sheet iron, or sod, but we are not concerned with these.

There are in general, but two classes of houses possible for homes. One may be called masonry, including brick, stone, tile, concrete and stucco. The other, frame, in which the exterior may be siding shingles or other forms of wood. Some might question stucco on wood or metal lath, and brick veneer on frame, being masonry, but for our purpose here we believe the classification is well made.

The appearance of homes has been frequently discussed in these columns. Brick, stucco and frame have been shown from time to time, in an endless variety of pleasing designs. Each style has its followers and from the mechanics to the tenants, each finds qualities of value. The value is there because time has tested it out and proved its worth.

Each style has its limitations also. Some styles are not as fireproof as others, some are not thought to be as proof against the weather. The qualities of each will not be discussed here, either in appearance or construction, but only in the one element, price.

Comparisons are not always satisfactory, for it is often impossible to bring in all the qualities which bear on the subject. For our purpose, however, we have prepared our May supplement with unusual care. Our idea has been to show a house in each of several styles, in prevailing classes of construction with truly comparative estimates. With this idea in view the supplement shows the plans for the house as actually built, of brick, with sections showing the walls, etc., of tile with stucco exterior and frame. The views on pages 37, 39 and 41 show the houses in brick stucco and frame, while the cover shows the same styles of exterior. The estimate is carefully detailed for brick, stucco, on hollow-tile, stucco on metal lath and frame. One can readily make a comparison, substituting, if necessary, any different local prices.

It may be argued that these figures would not be true for all buildings. Quite true, each house is a problem in itself. A slight variation from the plan might change the



prices considerably in favor of any one style of construction. But it is equally true that other variations would favor the other materials, so in this way the problem is properly presented.

In this estimate Mr. Hicks has been careful to use a good quality of brick for the brick house, heavy load-bearing tile for the tile house, galvanized metal lath for the metal lath and stucco house and equally good materials for the frame. The comparison is not intended to show that any one material is cheaper, or more expensive, for there are too many other qualities to consider. The good average quality will be apparent to everyone who analyzes the estimate.

The contractor doing only one class of work may not be greatly interested in this house. The builder who wants to keep up with the times however will see in it many possibilities, for who has not heard the question, "What will it look like in Frame, or Stucco, or Brick?" Above all, however, is the question "What does it Cost?" Sooner or later the question is asked and the wise contractor is prepared to answer. We are giving you the lead. Follow it up and get the business. Show your customers that there are several styles of construction, that there is a variation in materials, and that

the Price varies too. Keep the one idea in mind that to secure the Business you must be prepared to give the Owner what he wants, and will pay for, and that time is well spent in giving accurate information regarding Appearance, Construction and Price.

Where the owner of a lot knew of the existence of quicksand thereon which would increase the expense of constructing a building, and intentionally omitted from the plans and specifications matters which would be necessary to deal with the quicksand for the purpose of deceiving the contractor, the latter may abandon the contract and recover under the common count for the work already done by him.—*Ford & Denning v. Shepard Co.*, 90 A. (R. I.) 805.

In an action by architects for services rendered, where the defense was that the plaintiffs permitted improper and inferior materials to be used, evidence of the condition of the house about two years after its completion, accompanied by evidence tending to show that its condition was the same then as when plaintiff certified that it was completed, was not too remote, and was improperly excluded.—*Lindeberg v. Hodgens*, 148 N. Y. S. 153.



A Home in Neenah, Wis.

Sindahl and Mathison, Architects.

# EDITORIAL

## NOTES AND COMMENTS

Be a "Thinker"! It is the thinkers who rule this country!

\* \* \*

Be a "Thinker!" An honest "Thinker." It is the "Thinkers and Thinkers," sometimes good, often bad, and at other times worse, who rule!

\* \* \*

Money-makers do not always oppress, though sometimes when they first start out to make money they do not consider the methods as they will affect others, but when they get older, they get wiser and their conscience awakens, and often they become public benefactors, as examples of which we have in Carnegie and Rockefeller, who make some efforts of returning to the public a part of the money they have taken from it. We find in the Scriptures, especially in the Psalms and Proverbs many sayings against the oppressor of the poor and you can hardly open either of those books but somewhere in their pages you will find a description of the wicked man's attempts against the poor, such as:

"He doth ravish the poor when hegetteth him into his net. He sitteth in the lurking places of the villages; his eyes are privily set against the poor. In his pride he doth persecute the poor, and blesseth the covetous, whom God abhorreth. His mouth is full of deceit and fraud, in the secret places doth he murder the innocent. Have the workers of iniquity no knowledge, who eat up my people as they eat bread? They have drawn out the sword, and bent the bow, to cast down the poor and needy. They are corrupt, and speak wickedly concerning oppression. Pride compasseth them about as a chain and violence as a garment. Their poison is like the poison of a serpent. Ye weigh the violence of your hands in the earth."

\* \* \*

These along with many more sayings go to show that the poor man has always been the prey of the rich.

\* \* \*

But what about the poor man. Has he no faults? Why is he poor? He begins

life in his infancy like the rich man, the whole world is as much his as the rich man's and though he may not be born with a silver spoon in his mouth, the air, and the privileges are his, equally with the rich boy, if he owns a good, healthy body; and if he honestly strives upwards, why shouldn't he get a good competency, which is riches in abundance? The fact is, those who are poor remain poor, because they so will it. Nothing is gained in this—or in any other world—without effort, and those who are poor, and who imagine Heaven a "soft" place to live in, if they should ever get there, will be sadly disappointed, for they will find heaven a difficult place in which to reside, if they expect its favor to be within their reach, without special efforts of their own. Lazy, improvident, or careless people will find heaven as difficult to live in as old Mother Earth, if they make no efforts of their own to earn their happiness. No peace, no real enjoyment, and many a poor man, should he ever reach there, will be surprised at finding many of his supposed oppressors, occupying front seats in the sunshine. The poor have no business to be poor! There are ways and means to avoid poverty and wretchedness and it rests with the individual to avoid such conditions, chiefly by their own activities, votes and quality of brain!

\* \* \*

There seems to be a change of thought taking place among the better class of mechanics regarding the teaching of children in schools. Nearly all thoughtful men are in favor of more or less manual training being employed, and in some places the school authorities insist on devoting so many hours a week to be given to some trade or other in order that the students may acquire a fair knowledge of the working methods employed on the trade under consideration. It is interesting to note that the students in the Manual Training Department of the Western High Schools at Bay City, Mich., are being taught the practical side of house building by Instructor R. D. Paxton. The students are given blue-



prints and are instructed in the proper manner of carrying out the work which they cover. The work done by students thus far as an experiment has proven a great success and they will be taught not only how to build homes, but also the details of house construction. This new departure will be of great service to those students who wish to become mechanics after they leave school, and will also be of great benefit to every one, no matter what their future vocation may be.

\* \* \*

A course in Housing and Town Planning has been organized in connection with the summer school of University of Pennsylvania, and will be given by the following: Mr. Carl Aronovici, Ph. D.; Mr. Bernard J. Newman, Secretary of the Philadelphia Housing Commission; Mr. B. Antrim Haldeman, engineer in charge of City-Planning work in Philadelphia; Prof. James P. Lichtenberger of the University of Pennsylvania. The course is intended for housing inspectors, students of housing problems, town-planning commissioner, and other persons interested in housing and town-planning work. The course will consist of a series of lectures on the influence of bad housing upon the individual, methods of housing reform through legislation and municipal control, and the development of community planning, as an ally of housing reform. Dr. Aronovici will give a course on economics of housing and town planning and will conduct laboratories and discussions throughout the city of Philadelphia and the suburbs, as well as more distant communities, with a view of familiarizing students with the actual work. The course will begin the first week of July and will continue for six weeks.

\* \* \*

"Build now!" is good advice and quite timely. You may never have a better time. The high price of material will hardly come down as the demand for it is not likely to diminish, as there is in contemplation much building the public do not know of. Labor will keep up to its present level, and as the season grows older, there may be an increased need for labor. Taking everything into consideration the present time is the most favorable to start building construction, and there is no excuse, from a general point of view, for a delay of operations.

Then, work started now, will have plenty of time to be finished or so enclosed before winter sets in that much money can be saved on the contract and disagreeable inconveniences avoided. If the war should stop suddenly, which is possible, there will be a fluctuation in values and the cost of building will rise, which is another reason for "building now." In fact, the man who has to build, and hesitates, "is lost" or rather has lost money and opportunity, besides time, which is an important factor these days. Another thing, it is the duty of every good citizen to do all he can to help the community he lives in, and in the present lull in the labor world, he should assist in keeping the wheels of industry going around. This is patriotic, and humane, and has a much more practical effect in benefiting the country than Flag-waving and Spread-Eagle rhetoric would have. So be really Patriotic, and "Build Now."

\* \* \*

When Foundation Stones are laid, if the building is of importance, speeches of one kind and another are nearly always made; and the coloring of these speeches is always full of praise to the promoters, donators and the architect, but the man who transforms the shapeless materials of which the building is to be erected and formed, into a "thing of beauty" and use, is rarely or never mentioned.

A friend of ours, a large contractor, has built a good many big buildings and has attended, of course, all the foundation stone layings and all the official openings of these buildings. He is a builder who does not build for profit, although profit certainly enters into it, but he builds with pride, and he never returns from any of these functions but that he deplores the fact that the builder's name was not mentioned in any speech made. He, of course, realizes that the architect does the most important work, but he also thought he came in a good second in carrying out the architect's plans and desires. It is not the designer of a great work that stands first in the eyes of the multitude, it is the work itself, and the artistic working of the details, and the solidity of construction that make a noble work, and all this is due in a large measure to the contractor whose daily supervision leads to a successful completion of the work.

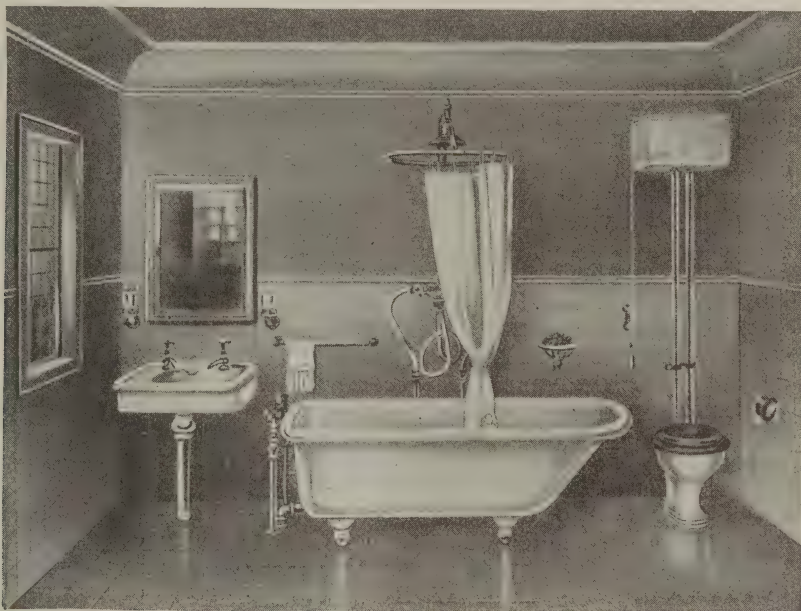
# Sanitary Features of the Home

*Chas. F. Smith*

**I**N these days of marvelous progress in the arts and sciences much scientific engineering work has been accomplished for the home, whether located in city or country. No longer are we obliged to depend solely upon the venerable brick

regard to their uses and the elimination of eye strain, and our bathing and other toilet appliances are confined to one cozy, comfortable room in a pleasing and sanitary manner.

It is, however, often a problem for the



A Modern Bathroom Furnished by B. Y. Karol.

fireplace for our house heating, with its strong drafts and localized heat, nor upon its accomplice, the portable stove, with all its dirt, coal gas, and back-breaking labor of coal carrying. Nor need we depend for our lighting upon the tallow dip, and the inefficient, and always hazardous oil lamp; and, when the regular bathing day comes around, it is no longer necessary to bring mother's washtub into the kitchen, where boilers and kettles are engaged in heating water for the family bath; nor do we now find it necessary to decorate our grounds back of the house with a little 4 x 6 cottage covering the abhorrent and always unsanitary privy vault; but instead our modern houses are uniformly and comfortably heated, regardless of weather conditions; our rooms are properly lighted, with due

inexperienced owner to decide upon the best appliances to install in his new home. He has only a very general idea that the house should be heated and lighted, and that the bathroom should contain a tub, a water closet, and probably a wash basin, and that possibly some other plumbing appliances should be included in the house, but he has no idea as to how all this should be done, nor the better appliances to select for his particular case, and must, perforce, depend upon his architect or contractor for suggestions and advice. It therefore behooves the contractor to keep thoroughly posted on the various sanitary appliances in the market, to maintain a complete and up-to-date catalogue file, and not to be too firmly tied up with any one particular brand. "Sanitary" applies as well to the



heating and lighting equipment as to the plumbing apparatus.

It not infrequently happens that manufacturers revise their catalogues, or issue new ones at uncertain periods, because of improvements or modifications in their product, and fail to send copies to all of their customers, thus leaving the latter with an incomplete file; it is therefore advisable for contractors to send a request once or more a year to the manufacturers of heating, lighting and plumbing appliances for a new catalogue, and to discard the old ones. Here is a case in point. An owner recently decided to install a large furnace in place of an old and inadequate one, and, as the old furnace and the range were of one make, he thought favorably of installing the latest improvement of the same brand, which was designated in the latest catalogue of the manufacturers, we will say, as their "900 series." Three contractors were called upon for figures; two did not handle that make at all, and were not inclined to do so but offered something else "just as good," although their arguments were not wholly convincing; the third could handle that make or any other, but his latest catalogue did not include the series asked for, and he was all at sea for a price; it was a hurry-up job, but he was given a day's time to get information, and it resulted in his getting the job, to be followed no doubt by other work; but he was greatly chagrined to find that his catalogue file had dropped behind, and that a would-be customer had known more about the latest improvements than himself. Moral: Keep after the catalogues, and become familiar with them and with the advertisements in your trade paper. Every up-to-date contractor takes at least one trade magazine. He must or he is not "up-to-date."

One may, however, have a complete catalogue file, and yet often be undecided as to what particular make or style of apparatus to select for some particular case; in fact, many articles, such, for instance, as plumbing fixtures, are practically duplicated by all the manufacturers in the trade, and the problem resolves itself simply into a question of reliability of product, reputation for fair dealing, and price; and, sometimes the matter of early delivery is of paramount importance. It would seem desirable in all cases to consult the owner's taste and preferences, at least where the

prices are practically the same, particularly in the selection of such obtrusive appliances as the plumbing fixtures and radiators, or registers.

It is doubtful if anything adds more to the comfort and attractiveness of the home than a completely equipped bathroom with its pleasing array of snow white fixtures, such, for instance, as illustrated in this little sketch.

Here we have an attractive and serviceable lavatory of porcelain enameled iron, with its pretty mirror and other necessary fittings, an inviting bathtub, also of enameled iron, and a porcelain water closet with the almost universal low down tank. We should not forget in this equipment to include a medical cabinet of white enameled steel, which may be either portable or recessed in the wall, but, in whatever form, it is really a necessary adjunct. The lavatories may be had in many forms and sizes, as corner basins to fit snugly into the corner of a small room where space is limited, or of more pretentious size to fit against the wall, in the corner or elsewhere, and of still more imposing pattern, the pedestal form, as illustrated above. The wall types are made up of marble slabs with porcelain bowls, and also of porcelain enameled iron in one or two pieces, either form being supported from the wall on brackets or from the floor on nickel-plated standards. All forms are supplied with nickel-plated adjustable traps. For sanitary reasons, as well as for appearances, the one-piece porcelain enameled iron lavatory is much to be preferred. That same assertion applies with equal or greater force, if possible, to the kitchen sink and the washtubs; although the latter are often made of slate slabs cemented and bolted together, and also of cement alone. Either form will last a lifetime, and prove far more sanitary than the old style, made-up wooden tub.

Every one these days feels the need of running water in the house, both hot and cold. While that does call for the expenditure of considerable money, the added comfort and convenience well warrants the outlay, and, in fact, in the city or town it is an absolute necessity, as no wells or springs are available; but in the suburban district, where a well or cistern is at the door, or, perhaps, even with a pump in the kitchen, it may seem in some cases not only an unnecessary expense, but an almost impossible

job, to secure running water in the house. However, the difficulty is very easily overcome by providing a wooden or iron tank just under the roof, connected by a suitable

water needed for a small family. Of course, a still better plan is to install a gasoline engine pumping outfit, or, if electric current is available, an electric motor equipment, where the amount of water required will warrant that expense. Either equipment may be had to work automatically.

One need not despair, however, of obtaining the conveniences of running water in the house because of the expense of installing the necessary plumbing pipes, if they are not already there. We are all more or less familiar with the old-time wash bowl and pitcher, which still prevails to a considerable extent in rural districts, and with its limitations and displeasing appearance; but there has recently been devised a lavatory of very attractive appearance, possessing many of the advantages of the regularly installed fixture at only a fraction of its cost. As shown in Figure 2 it consists of the pedestal and a seventeen-inch bowl of white enameled iron, with the water tank of liberal size above, in a polished or white enameled oak cabinet. The nickel-plated down pipes are provided with self-closing faucets. A gas or alcohol heater of neat design can also be attached, so that one may have hot and cold running water in any room in the house at very little expense, and there are so many cases where a little real hot water is urgently needed, such, for instance, as a sudden illness at night requiring the use of a hot water bag when the fires are out or banked, or for an early morning shave in mid-winter, when a cold water shave is as comforting as an icicle down the back, that the expense, even if much greater than it is, would be justified.

In the cities or towns of a considerable size having a sewer system, the matter of sewage disposal from the individual house, with our present careless and inefficient methods, is a very simple matter, being merely a connection from the house sewer to the street sewer, which in turn discharges into a seaboard harbor or a nearby river. With the vast area of our country, and a comparatively small population, that has not seemed in the past to be a matter of any great importance, but our population is increasing enormously, and the question of sewage disposal, even in our seaboard cities, is rapidly reaching an acute stage, and with our inland cities threatens to turn our rivers into semi-navigable open sewers, menacing the health of the adjacent population.



A Ro-San Lavatory for Hot and Cold Water.

pipe to the pump, a connection being made from this pipe to supply the various fixtures in the house. Usually a few minutes' pumping once or twice daily will supply all the

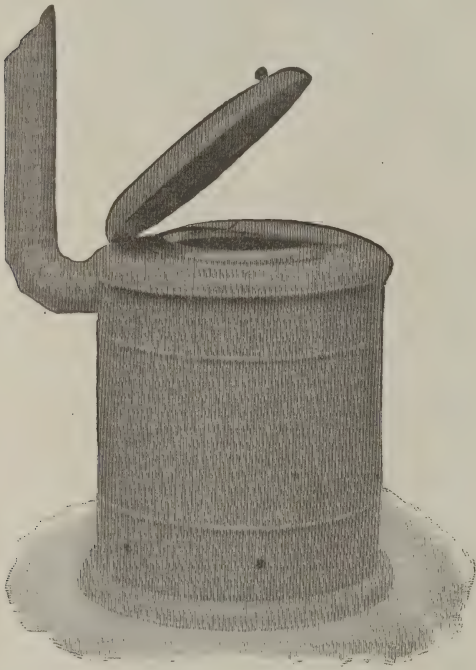


In the suburban or rural district, where the public sewer is not available, other means must be provided for the disposal of the house sewage; and in the past that has been most generally accomplished by recourse to the abominable privy vault. It is now being quite generally recognized that this relic of bygone ages is absolutely unsanitary, constantly endangering the health of residents within a considerable radius of it, and that it is entirely unnecessary even on the plea of low first cost, as it can easily be superseded by the sanitary and economical septic tank. This may be constructed of concrete on the job, or steel tank, specially con-

structed, is intended only for the discharge from the water closets, as it would fill up too quickly if all the waste water was discharged into it; but steel tanks can also be obtained which are designed for continuous operation, being provided with an overflow connected to a system of porous drains extending for a considerable distance under the surface of the ground. The concrete tanks are always constructed in this manner. Another appliance becoming quite popular in districts devoid of public sewers is the indoor chemical closet approved by State Boards of Health.

As illustrated herewith, it consists essentially of a container into which is poured the chemical with a certain amount of water; this is then placed within the storage chamber, which in turn has its vent pipe connected to the chimney or extended through the roof if desired. The whole affair is very simple, very low in first cost, and in maintenance, thoroughly sanitary, odorless, is easy to install, and may be placed in any room in the house or in an unused closet. The chemical renders the excreta harmless and odorless. It is one of the latest things in sanitary appliances.

It is just as important to properly heat the house as it is to have sanitary plumbing, but whether it shall be accomplished by steam, hot water, or hot air, is largely a matter of personal preference and the amount of money allowed for the job. We leave out of consideration, right at the beginning, the portable stove, and also the fireplace when used alone for heating purposes, although the open fireplace, when used in conjunction in some other source of heat, has attractions from an artistic view point which cannot be denied. It is one of the peculiarities of the human animal that he is attracted by a fire, while other animals will fly from it in terror; and so it is that the open fireplace, even in the most modern house, holds sway and occupies a large corner in our hearts, for who does not enjoy the pastime of sitting before the open fire on a long winter evening, toasting the shins while drawing fairy pictures in the flames, and watching the wreaths of smoke float lightly up the chimney; but while that is very pleasant for the front, we must protect our backs from the chilling effects of an inadequately heated room, by supplying additional heat from some other and more



A Sanitary Closet.

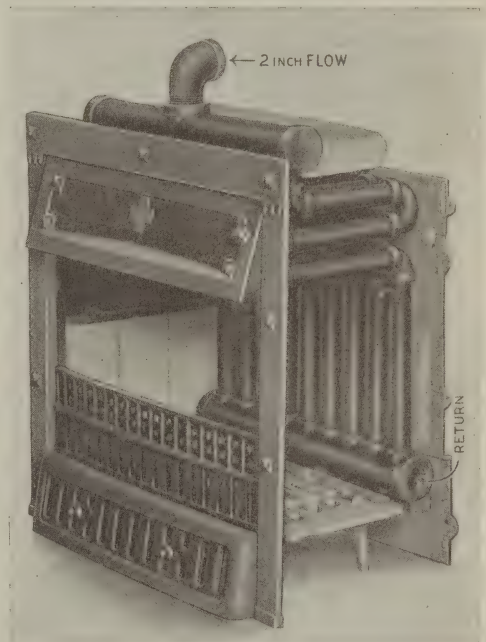
structed for the purpose, may be obtained from the manufacturers all ready to set in place and connect up to the house sewer. The septic tank has everything to commend it; it is thoroughly sanitary, is economical in first cost, costs nothing to maintain; being below the surface of the ground there is no unsightly structure to mar the landscape, and also, for that same reason, it cannot become a breeding place for the pestilential house fly, that great disseminator of typhoid and malarial germs. Another advantage is its freedom from obnoxious odors which poison the air from the privy vault. The steel septic tank, as usually con-

direct source, such as radiator or register; and then, with all its charms, the open fire, whether of wood or coal, is an element of danger, as hot sparks and blazing embers are liable to fly a considerable distance causing damage more or less serious. As an illustration, here is an actual occurrence. A room about fourteen feet by sixteen feet on the upper floor of a large house was occupied by a lady member of the family, and contained, with other furniture, a couch, which was placed against the wall directly opposite an open fireplace. The house is heated by a large furnace, but some of the rooms, for additional comfort, are fitted with open fireplaces and grates for either coal or wood; in this case hard wood was being used, and at this time the lady placed a few sticks on the fire and left the room, intending to visit a neighbor for a short time. But ladies get to talking and forget that fires continue to burn. Not very long after the lady's departure another member of the family chanced to pass the open door of her room when the crackling of flames attracted attention, and investigation revealed a brisk fire burning merrily under and back of the couch. At first it appeared of mysterious origin, but a careful examination disclosed a spot on the wall paper, a short distance above the couch, where a blazing ember from the fire, fourteen feet away, had struck and falling back of the couch, dropped into a large open pasteboard box containing a number of family photographs, which had been carelessly pushed under the couch. The result was a shortage of family portraits, a badly burned couch and carpet and a hole through the floor which required several feet of lumber to patch up; and, had the discovery been delayed just a little longer, the house would very likely have been destroyed, or, at least, very badly damaged.

This is only one of several cases known to the writer of damage caused by the open fireplace, and it is very earnestly urged upon all contractors fitting houses with an open fireplace, to provide in all cases, in the interests of humanity and fire prevention, a wire screen guard, which may be, and, in fact, should be, of ornamental designs; it detracts in no way from the enjoyment of the fire, but tends to safeguard life and property.

We all know that with the open fireplace the greater part of the heat goes up the

chimney and is lost, but with the improvement shown in Figure 4, which consists of a fireplace fitted with a heating coil; this waste heat can be fully utilized and one or two additional rooms heated by hot water without increased expense for fuel, certainly a desirable feature. If the owner should decide to heat his house by means of hot air from a furnace he will have the advantage of improved ventilation, and lower first cost than with steam or hot water, and he will have many excellent makes to select from of either the brick set or portable



A Heitland Fire Place with Hot Water Back.

type. There is really no advantage possessed by the brick set furnace over the portable type, and it is considerably more expensive to install. The portable type should, however, have the shell covered by asbestos plaster about one inch thick, to secure the greatest economy in operation. Whatever type is selected it must, of course, be absolutely gas tight, and, naturally, the furnace having the greatest amount of radiating surface is the more efficient. But whether that surface is cast iron or steel makes no material difference in the operation.

It is strange that the black enamel finish for the hot air registers should be so closely adhered to for the home as to become prac-



tically universal, and yet it is positively hideous. Anything more inharmonious with the furnishings of a home could scarcely be imagined; but it is probably due to the lack of thought on the part of the contractor, and lack of knowledge on the part of the owner that for very little additional expense he could have any other design and finish desired, which would add to, rather than detract from, the appearance of the room.

With the boiler for steam or hot water heating, as with the furnace for hot air heating, there is a long list of good ones to choose from, of sectional cast iron and of steel, horizontal and vertical; in many cases the question of head room, or of floor space in the cellar, is the deciding factor; the question of price need not bother seriously, because there is but little difference with any of them; but in all cases the boiler should be covered with asbestos not less than one inch thick. An attachment of very great importance for either boiler or furnace is the damper regulator, which should be entirely automatic, and a still further improvement is a time clock attachment for the regulator which will automatically turn on the draft at a set time in the morning to have the house warmed before the family arise.

Any of the manufacturers of heating boilers or furnaces would be glad to furnish the contractor or builder with plans and specifications for the heating of the house, if they are provided with a pencil sketch of the floor plans of the house, giving sizes of the rooms, and location and sizes of doors and windows. In fitting an old house with a modern heating system, the steam or hot water plant has a decided advantage, as these pipes can be readily extended where it would be practically impossible to carry the hot air pipes without rebuilding, or seriously defacing the partitions.

A comparatively recent development, which should be adopted in all cases, is the fuel chute, built into the house for the delivery of coal and wood into the cellar. They may be obtained of quite ornamental design, with an iron front, and, in other cases, with a strong glass front to aid in lighting the cellar, and with a spring lock opened only from the inside, rendering it absolutely secure.

The question of properly lighting the house is an important one, although in the city or town, where gas or electricity are available and easily introduced into the house, the solution is not difficult, and often both are used in the same dwelling, electricity supplying most of the light and gas doing most of the cooking, as electricity is usually too expensive to do the cooking with, while gas, aside from being much less costly, is fully as convenient for that purpose.

While the gas and electric mains are being gradually extended from the central producing stations to the outlying districts, the chief reliance for the rural population must for a long time be placed in the isolated generating plant, either gas or electric. In farming districts, with a large house, barn and other outbuildings, and almost innumerable chores requiring power, the gasoline electric plant is indispensable, regardless of cost; it is flexible, "ever ready," always dependable, inexpensive in operation, and its uses are multitudinous; but in the suburban district, on the contrary, where the house is much smaller, with no outbuildings, and but few lights required, the individual gas generating plant seems preferable, whether of acetylene or gasoline, as desired, because of its low first cost, low cost of operation, absolute safety and availability for both cooking and lighting.

As an efficient lighting agent nothing can excel acetylene, and it is also efficient for cooking, the same appliances being used as for any other gas, except that it requires special burners. There are various models of generators in the market, any one of which requires but little floor space and very little attention. The generators for gasoline gas require perhaps a little more floor space, and the fire rules usually require that they shall be placed underground, or in a small separate structure because of the inflammable nature of the generating agent; but the gas itself is just as safe as any other in use, and it is just as reliable for cooking and lighting. They, too, are made in a variety of sizes and models, although the general principle of all is the same, of charging air with gasoline vapor in suitable proportions for efficient burning.

In the present age of efficient development no dwelling can be considered as fully equipped without some ready means of communication between the different floors of the house, or between the house and barn and other outbuildings, without being obliged to shout at the top of one's voice at the distant member of the household. This was formerly accomplished by the speaking tube, but this is now out of date; in use one must speak and listen alternately; its field is limited, and it is generally unsatisfactory, except in first cost. The intercommunicating telephone is rapidly superseding it. This is an instrument surprisingly cheap, highly efficient, affording instant communication with any part of the house, or with the barn or other outbuildings, or with a neighbor, though miles away, and is more easily installed from top to bottom of the house than would be the tube to the next room.

The successful builder and contractor today is he whose general knowledge covers a wide range of subjects relating directly and indirectly to his business of erecting buildings. He is called upon by architects, owners and neighbors for information and

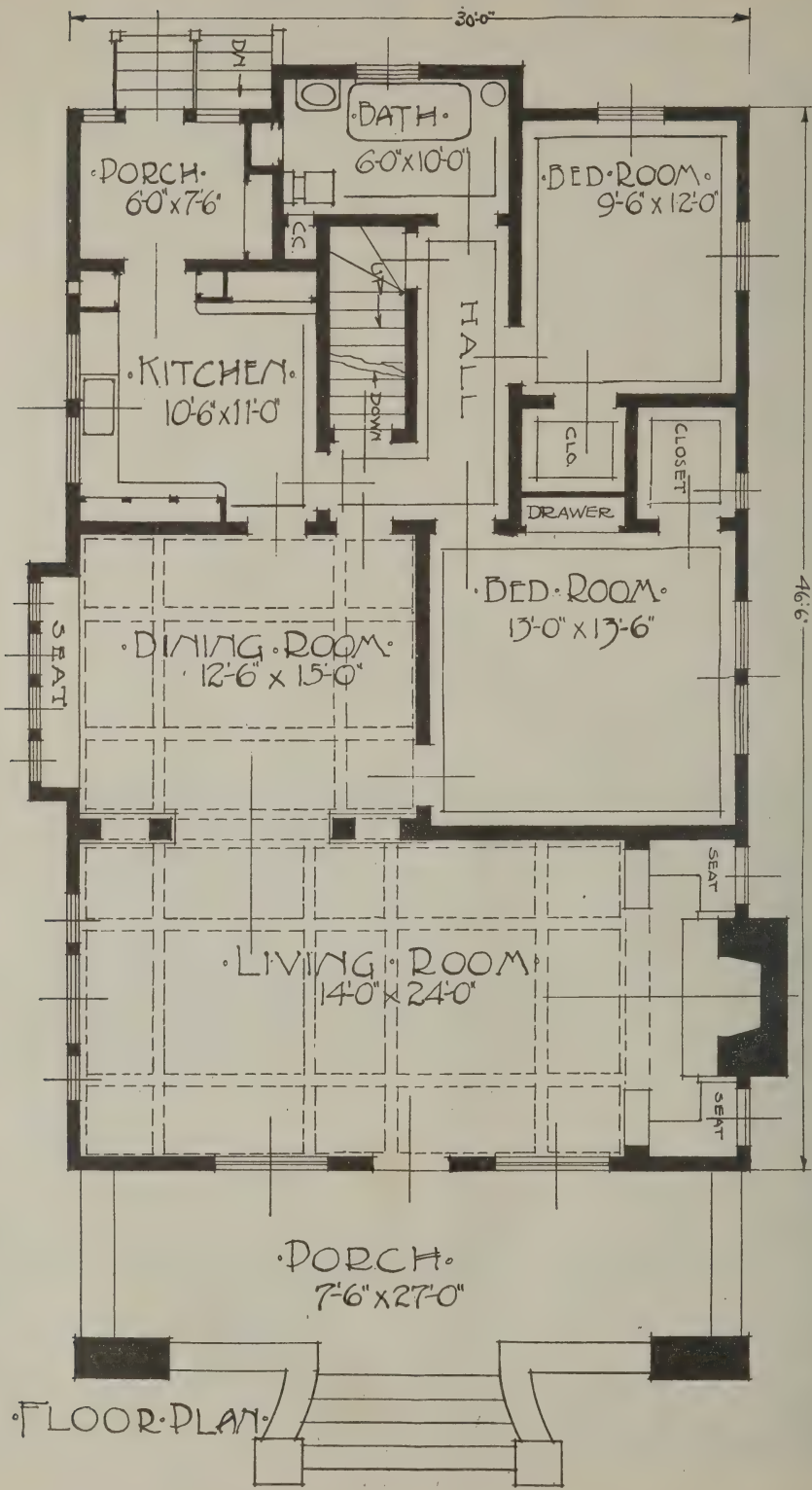
advice regarding a great variety of projects, very many times, but not always, including the installation of heating and ventilating, or plumbing or lighting apparatus, and, if he keeps himself thoroughly posted on these various matters, his knowledge inspires confidence in his ability, his integrity and his judgment, and his business grows in consequence. Hence, peruse the advertisements in your trade magazines, and study the catalogues. They are an inspiration.

The certificate of an architect, showing the cost of completion of a building by the owner, on default of the contractor, under a provision in the contract for such completion, making the contractor liable for the excess of the cost thereof over the balance due him, to be valid and conclusive, agreeably to the terms of the contract, must be founded upon a thorough and careful audit of such expense. A certificate of expense under such a provision has not the dignity and conclusiveness in law of an award of arbitrators and may be impeached or set aside in a legal forum. —Parr v. Howell, 82 S. E. (W. Va.) 126.



A Sunny Bedroom.







Everyone Looks Twice at This Bungalow.

## An Attractive Bungalow

*Jud Yoho, Architect*

THE OUTLOOK has much to do with the happy appearance of this bungalow, and the bungalow's design was much actuated by the locality. It is not too much to say that when next summer's growth of plant and flower adorns this bungalow it will be one of the prettiest in the West.

First let us study the plan. The short flight of steps from the lawn to the porch is eight feet in width. The days of the narrow flight of entrance steps is done, as far as the bungalow proper is concerned; the wide steps lends itself to heavy detail, whereas the narrow "cozy" step must have with it other "cozy" detail, and all must be designed in accord therewith. In a word, the modern bungalow steps are not the "cottage" steps of old.

Here also is an extremely wide porch—nine feet from the face of the front wall to the outside of the porch wall; and this porch extends from wall to wall, clear across the width. The stretch of this porch provides for the long arch type of front and this is the conspicuous feature of the elevation.

We now step within the house. The main entrance door is placed in the center, and is of good width, three and one-half feet by seven feet in height, and in thickness one

and three-quarters inches. On each side of this front door are large windows, the glass being American polished plate. These, you would say, make fine windows, and indeed, they do; a beautiful view is to be had from all windows of the front and the left side of the house (the front, by the way, facing east towards the Cascade Mountains), and this fact is well considered in the provision of fine windows; all the view window glass in the living room is plate. The living room is a magnificent room, occupying the full width of the house, and including the inglenook being thirty feet long; the width of the living room is fifteen feet. The ceiling of this room is richly beamed, and exquisite electric fixtures are suspended from two outlets centered in the panels. The fireplace scheme is a genuine inglenook, "encased" as it were with beam overhead and its own special treatment, and having cozy corner seats to right and left and art glass windows above.

Now the living room is directly open to the dining room, so that here again the principle of the largeness and spaciousness obtained by this method is followed. The dining room is approximately thirteen and one-half feet by sixteen feet in size and has a large square bay window occupied by a



seat, and under the seat is the cold air inlet for the furnace. The dining room has also a beam ceiling with a center electric pendant fixture.

A very good arrangement of the floor plan is seen in the hall which is entered from the dining room or from the bedroom which adjoins the dining room, giving access to stairs going down to the basement, up to the attic, and also to the bathroom, the rear bedroom and the kitchen. It is seldom one sees a plan which places the rear hall in such a handy manner to the larger number of units of the floor plan.

Coming now to the bedrooms, two in number. The larger bedroom is thirteen feet by thirteen and one-half feet between walls. A large closet is on the outside wall, five and one-half feet by five feet, and the door to this closet has for a panel a full-length bevel plate glass mirror. It is to be remarked also that this closet has an outside window—always a very desirable thing in a closet. Another feature of this bedroom is the clever location of the large windows—it is possible in this bedroom to set the bed in any of the two or even three positions, and comfortably; the bed may be set at an angle in a corner, or against either of the two inside walls. Many architects will not put their "O. K." on a bedroom unless the housewife can place the bed in at least two positions, since the majority of housewives' minds is always the desire to have things "different"—to "change around." It will be noted that a cold air outlet is provided in the bedroom also.

The lesser bedroom is roughly ten feet by twelve feet in dimensions, and this room also has a large closet. This bedroom has two windows, one on each wall, and it should be stated that it is always desirable to furnish a corner bedroom with a window on each of the walls. A clever color scheme for the larger bedroom is old rose and soft whitish cream tints for the walls and ceilings, and white enamel for the woodwork. The smaller bedroom a ceiling of white, and walls of quiet blue, the woodwork again in white enamel.

The bathroom is of very liberal size, being about six feet by ten feet in the clear. The cupboard, or "medicine case" as it is commonly called, is cleverly set alongside the kitchen porch cupboard. The boiler is placed in the bathroom here, and when

treated in white is not an obtrusive piece of furniture in a bathroom in where everything is white. While looking at the floor plan of this bathroom, it will be noted that in one corner is a door leading to a clothes chute, this chute being an excellent way of getting the linen to the laundry tubs in the basement.

In considering the kitchen the "kitchen porch" feature must be included. Here we have a kitchen and what might be termed a "rough kitchen" or a "kitchen porch" adjoining, this kitchen porch being completely an exterior member of the house, and being screened in on all sides with fine wire screen. A large cupboard is placed, as part of the equipment of this exterior porch, against the interior wall. The kitchen itself is liberally equipped. There are two large cupboards, a broom closet, a cooler, and the large sink and drainboard. Both cupboards are provided with work table and with bins, and all the other conveniences.

This bungalow, though not showing in the exterior any particular earmarks of being a two-story structure, has, in fact a very spacy upstairs. The stairs leading to the second floor, which is really an attic, is three and one-half feet wide—a very liberal stair. One great room, a bedroom, with four large closets, and a fine sleeping porch constitutes the floor plan of this attic. The large bedroom, extending clear across the side of the house, and directly centered under the ridge, makes a magnificent room. Would not such a room as this, with big windows in each end, treated with liberal bungalow art, and with the ceiling all raftered to the ridge, make a grand room? This is thrown out as a suggestion—occasionally one sees a treatment of this kind, but it is rare. The sleeping porch is nicely designed, with an inset center window group, and two small windows at each side of this group, underneath each of the latter a little seat.

The exterior of this bungalow is of distinctly utilitarian design, yet is unique and attractive. The long side lines are excellent, and show a boldness and breadth of treatment very handsome and satisfying. The shingles, of red cedar shingles, set alternately two inches and six inches to weather, make the material for the side walls, and the roof is entirely shingles.

# Some Notes on the Steel Square

Figure 34. Standing on the bank of a river and wanting to know the height of the bank, and also the height of an object on the opposite side of the river, I placed the square and protractor at the point A,

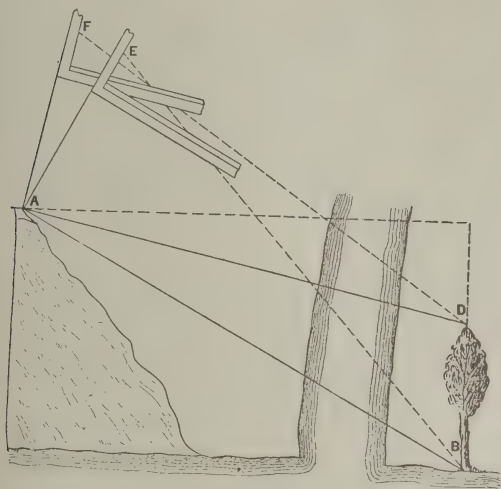


Figure 34.

from which I took the angle of depression of the bottom of the object, equal  $28^{\circ} 30'$ ; and of its top, equal  $12^{\circ} 30'$ . At right angles to the point A, and the bottom and top of the object, I measured 20 yards, to the points E and F, where I placed the square, and found by observation to the bottom of the object, that 12 inches on the line AE gave 33 inches on the line AB, 20 yds. = 60 ft.  $\times 33 = 1880$  in.,  $\div 12 = 157.5$  ft. = 52.5 yards, the distance from the station A to the bottom of the object B. 12 inches on the line AF gave 29.4 inches on the line AD, 20 yds. = 60 ft.  $\times 29.4 = 1764$  in. = 147 feet = 49 yards, the distance from the station A to the top of the object D.

To find the height of the bank; place one leg of the dividers on the protractor, at the point  $28^{\circ} 30'$ , extend the other leg to the intersection of the protractor with the diagonal equal to 25.2 inches, and to the internal angle of the square, equal 12 inches. Then as in proportion  $25.2:12::52.5:25$  yards, the height of the bank.

To find the height of the object: Place one leg of the dividers on  $12^{\circ} 30'$ , extend the other leg to the intersection of the pro-

tractor with the diagonal, equal 23 inches, and to the internal angle of the square, equal 4.77 inches. Then as in proportion  $23:4.77::49:10.16$  yards. 25 yards — 10.16 yards = 14.84 yards, the height of the object.

Figure 36. Wanting to know the distance to, and between, two inaccessible objects, A and B, I measured 45 feet at right angles to the objects and station to the points S and P; I placed the square on the line CS and found that 12 inches on the line CS gave 20 inches on the line CA.  $45 \times 20$  inches = 900 in.,  $\div 12 = 75$  feet, the distance from the station D to the object A. I further noticed that 12 inches on the line DP gave 21.6 in. on the line DB.  $45 \times 21.6$  inches = 972 in.,  $\div 12 = 81$  ft., the distance from the station D to the object B.

To find the distance between the objects A and B: Place the protractor and find ACB equal  $68^{\circ}$ ,  $\div 2 = 34$ . With one leg of the dividers on the protractor, at the point 34, extend the other leg to the inter-

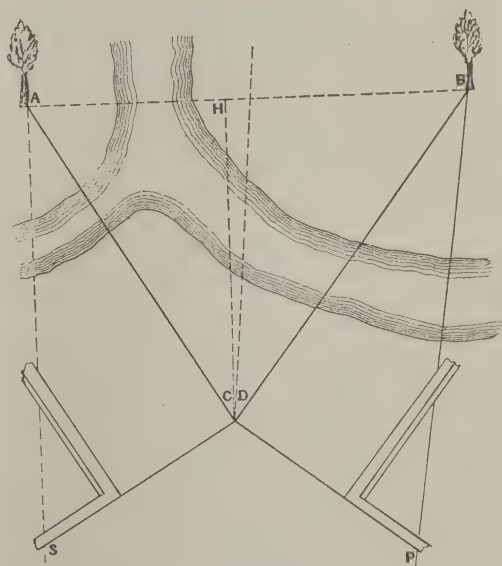


Figure 36.

section of the protractor with the diagonal, equal 26.5 inches, and to the internal angle of the square equal 14.75 inches. Then as in proportion  $26.5:14.75::81:45.08$  feet.  $81 - 75 = 6 \div 2 = 3 + 75 = 78$  feet.  $26.5:14.75$



$78:43.41$  feet,  $+45.08$  ft.  $=88.41$  feet, the distance between the objects.

Figure 37. Observing three objects, A,

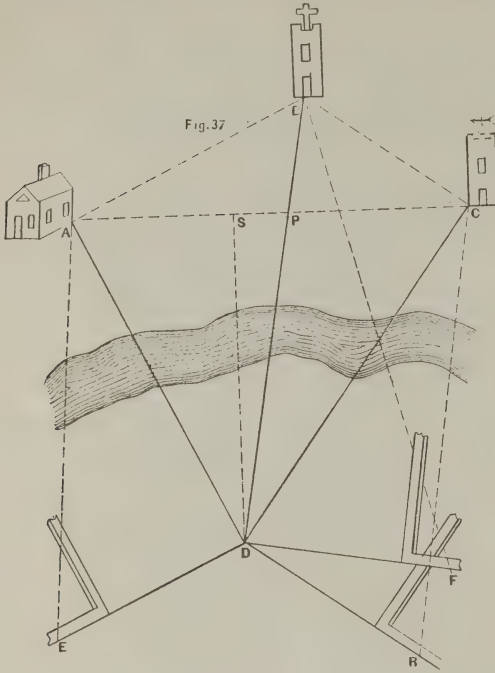


Figure 37.

B, C, whose distance apart I wished to know; and also their distances from the station D, I measured off at right angles

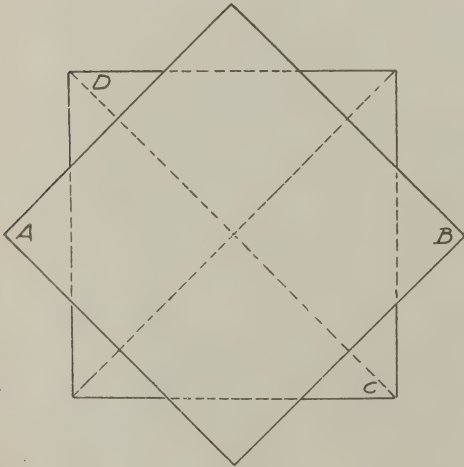


Figure 38.

to D A, D B, and D R, 45 feet, to the points E, F, and R. Placed the square and found that 12 inches on the line D E gave 20.8 inches on the line D A.  $45 \times 20.8$  in.  $=$

936,  $\div 12 = 78$  feet, the distance from the station to the object A. And that 12 inches on the line D F gave 25.6 in. on the line D B  $45 \times 25.6$  inches  $= 1152$ ,  $\div 12 = 96$  feet, the distance from the station to the object B. And also that 12 inches on the line D R gave 23.2 inches on the line D C.  $45 \times 23.2$  in.  $= 1044$  in.,  $\div 12 = 87$  feet, the distance from the station to the object C.

By the use of the square and protractor I took the angle A D C, equal  $62^\circ$ ; and the angle A D B, equal  $36^\circ 20'$ ; to find the distance between the objects A and C;  $62 \div 2 = 31$ , extend the dividers from 31 to the point 22 in. on the square, equal 24.8 in., and to the internal angle of the square, equal 12.2 inches. As in proportion  $24.8:12.2::87:42.55$  feet.  $87$  ft.  $-78$  ft.  $=9$  ft.,  $\div 2 = 4.5$  ft.,  $+78$  ft.  $=82.5$  ft.  $24.8:12.2::82.5:40.58$  ft.,  $+42.55$  ft.  $=83.13$  feet, the distance between the objects A and C. To find the distance between the objects A and B: Extend the dividers from  $36^\circ 20'$  to

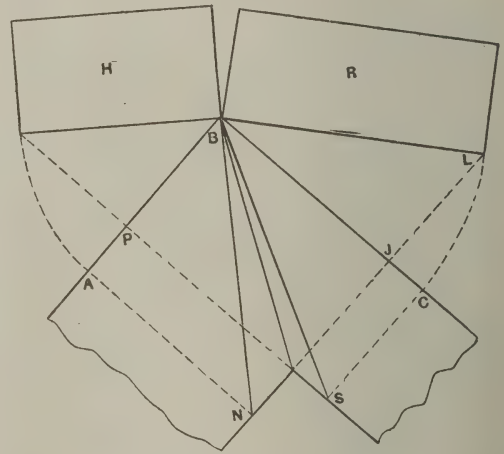


Figure 39.

the point 22 in. on the square, equal 26.5 inches, and to the internal angle of the square equal 16 inches,  $26.5:16::96:58$  feet, the distance between the object A and B. To find the distance between the objects B and C:  $62^\circ - 36^\circ 20' = 25^\circ 40'$ . Extend the dividers from  $25^\circ 40'$  to the point 22 inches on the square, equal 23.6 inches; and to the internal angle of the square, equal 10.5 inches.  $23.6:10.5::96:42.28$  feet, the distance required.

Figure 38 exhibits two equal squares, A B and C D. To place them together and

mark from their sides to form an octagon. Draw the diagonals on the square C D; bisect the sides of the square A B; place the points of bisection on the diagonals of the square C D; mark from the sides of A B for the angles to be removed to form the octagon required.

Figure 39 exhibits the plan of a right angled mitre. To find the angles to cut the sides and mitre the edges, when the run of the sides and the angle of elevation are unequal. Extend S P and N J equal the rise of the sides H and R; from the point B as center describe the arcs; join

B N and B S. Then J B N equals the angle to cut the side of the piece H; A B S equals the angle to cut the side of the piece R, and B L J equals the angle to cut the edges.

By the use of the square. Place the square on the side of the piece H, with P S on the blade and P B on the tongue; mark from the blade. Place the square on the side of the piece R, with J B on the blade and J N on the tongue; mark from the blade for the cuts required. Place the square on the edges, with J B on the blade and J L on the tongue; mark from the tongue for the cuts required.

# Architectural Drawing Lessons

## Twenty-Third Paper

IT is advisable to open a small book in which every drawing and print is entered with full information as to its purpose. Every drawing should have its serial number throughout the whole course of the work, and the book should show in parallel columns: 1, the number of the drawing; 2, date when being made; 3, description of drawing; 4, its scales; 5, whether on paper, tracing cloth, or tracing paper; 6, by whom drawn; 7, to whom sent; 8, when sent, and if required; 9, how sent. This at first sight would appear to involve a great deal of extra work, but in practice it does not increase the labor of a staff to any appreciable degree. Its advantages are obvious, for the whole history of every drawing can be followed up in a moment, and no other question as to where a particular drawing or print is, ought ever to arise.

It must be borne in mind, however, that this register is quite useless if the draftsman—and unfortunately such carelessness is by no means rare—omits to write the name of the drawing in full and its number on each sheet. It is also safest to write on the name almost before the drawing is begun, as then it is most likely to be remembered, for the majority of drawings are finished in a hurry and handed over to be traced by a junior. The junior does his work, titles his tracing and sends it off, while the original goes into a drawer, to lead later on to endless discussion as to what job and what portion it deals with.

Most architects stipulate in the speci-

cations that on the completion of the work all drawings are to be returned by the builder. Whether this be done or not, all drawings referring to the completed building should be collected together and done up into a roll, docketed, and put away among the records of the office.

Inks and instruments have been largely dealt with in previous chapter, but before discussing brushes and colors it may not be out of place to say a word about the many architects and engineers colored inks which are advertised as being waterproof. Probably more drawings have been ruined by falling into this snare than from any other cause. The majority of the Indian and Chinese inks, are undoubtedly waterproof, but there is scarcely a colored ink which will bear coloring over without "running." Drawings are often finished up in ink with the sections, dimensions, drains, and what are not, in red, blue and green, relying on the waterproof qualities of the ink, and then, when the color washes are laid on, the inks run in such a terrifying manner as to qualify the drawings to compete with a rainbow. It is better not to use these "indelible" (?) inks until all the coloring has been done, and then, as there is no risk of "running," the ordinary color box may be used instead. Colored inks are in no way necessary to an architect. The most convenient form in which to buy colors is undoubtedly that lately introduced by Windsor & Newton. These colors, which include Venetian Red, Sepia, Yellow Ochre,



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Drawing

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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z & c

Scale. Scale.

Scale of 1 in. to 1 ft.

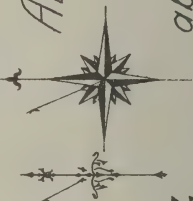
Scale. 3 feet to one inch

Scale. 1 inch to one foot

A B C D E F G H I J K L M N O

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A B C D E F G H I J K L M N O P Q R

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LETTERING FOR PLANS.

Figure 150.

Lamp Black, Prussian Blue, and all the ordinary colors used by architects, are made up in hexagonal cakes about two inches long, and contain approximately as much color as two and a half of the ordinary size, the saving is obvious.

According to some practice,  $\frac{1}{8}$  scale drawing of brickwork in elevation is colored very lightly with a tint of light red, or Venetian red, and brickwork in section by the same color laid on more thickly. In the country crimson lake is often used by engineers and surveyors not only for walls, but also for plans of estates, etc. Stone is fairly universally indicated in elevation by a very pale tint of yellow ochre (or else it is left white with the courses shown by the inking in). In section it is indicated by a bold tint of indigo. On  $\frac{1}{8}$  scale drawings in New York, woodwork is represented in section and elevation by sepia, ochre, a darker tint being employed for sectional parts. On detail drawings sepia is used for wrought wood in section, and burnt sienna for sectional parts, whether wrought or unwrought.

Internal or external plaster work is indicated by a tint of yellow ochre on all drawings, but where required for details, as in mouldings and sections, purple is generally employed. This tint is best made by mixing crimson lake and Prussian blue, with a darker tint for the sections. It may be remarked here that all sectional parts are colored more darkly than the same material in plan or elevation. Concrete is indicated by Payne's grey. Leadwork, the little that appears on elevations, is colored by any blue which does not cause confusion with the other blues which may be employed in the same drawing. In leadwork details a bluish green tint should be used. Floor tiles and mosaic are colored with a touch of crimson lake and light red mixed, while for the roof tiles the same colors are employed, but often with sepia or brown sepia added so as to more closely approximate to the actual color of a tile. Slates are indicated by a greenish grey, which may be obtained by mixing Payne's grey and burnt sienna, or indigo and burnt sienna. For windows in elevation the glass can be

colored with a light tint of either of the latter, or, better still, with a mixture of Prussian blue and burned sienna. Some architects prefer to use a light wash of lamp black for this purpose. Green is hardly ever used alone, except perhaps for glass in section, and this occurs rarely. Lamp black is the best black to be obtained when walls or sections have to be blacked in instead of colored. It is a dull black which can be laid on perfectly even, and has not the bronze-like sheen which is the drawback to the use of Indian ink for this purpose.

Colors to recapitulate, which are required in an office for working drawings are: Light red (or Venetian red), crimson lake, yellow ochre, indigo, sepia, burnt sienna, Prussian blue, Payne's grey and lamp black.

Brushes can be obtained in great variety, but the draftsman requires but few for office work. The most satisfactory way will be found to be the sable-hair brushes in metal ferrules or tubes, and although these can be obtained in sizes from 1 to 12, the draftsman will only need to supply himself with, say, No. 4 for filling in walls and small pieces, No. 7 or 8 for small washes, and No. 11 and 12 for large washes. Camel-hair brushes are cheaper but they lack the suppleness of sable, and do not spring or respond under the touch. Those who are not used to working with sable will find it very difficult to change to camel hair brushes, and it is a matter of universal experience that the sable brushes are the cheapest in the long run. Brushes ought to be washed out in clean water after use, the surplus water being "thrown" from the brush, and the bristles lightly brushed over the palm of the hand to bring them to a point before they are put away to dry.

At Figure 150, we show a number of examples of lettering suitable for many kinds of work and easily made. The figuring given is also plain and we would advise the young draftsman to copy such as he may wish to adopt for his work, and re-copy until he can copy them nicely. Later, we will show other lettering as examples.

(To be continued.)



# Our Dictionary of Trade Terms

MATERIALS, METHODS, AND PROCESSES IN  
BUILDING CONSTRUCTION AND  
FINISHING.

**ABUT,**—To adjoin to the end, to be contiguous to: generally contracted to "but."

**ABUTMENT,**—1. The solid pier or mound of earth from which an arch springs. 2. Abutments of a bridge, the solid extremities on, or against, which, the arches rest.

**ABUTTING JOINT,**—In carpentry.—The junction of two pieces of wood or members of an assemblage of timbers or framing. In this joint the fibres, or the

—pron. bar-en-klow (from Bar, a bear, and Klau, a claw or clutch). The plant is also known as the Brank Ursine.

**ACCOUPLEMENT,**—In carpentry. A brace or strut in a truss or tie-beam. The term is purely French, and means a coupling—pron. ah-coople-mang. The English pronunciation should be the same, but it is generally given as ah-koopel-ment. The term Accoupled (Eng. pron. ah-koopled) has for its French synonym Gemine (pron. ghay-me-nay), which has a curious derivation, as the word means iterated or repeated and this from gemeauz (jhay-moh) and Lat. gemini, the twins, that is, for example, two coupled or twin beams. The same idea is conveyed in the German synonym, which is zwillingspaarig (from Zwilling, twins or two, and Paar, a pair). The root of the term Accouplement is the verb accoupler (ah-koop-lay), to tie together, to pair or to couple.

**ACROTERIA,**—In Architecture. Small pedestal for busts or statues placed in pediments at the apex or point of meeting of the angular sides, or at the corners of the lower part of the pediment. Syn. Fr. Acroteres—pron. ah-kro-tares: Ger. Giebelzinnen—pron. Gee-bel-tzin-nen. Der. Gievel, a gable, triangular wall or pediment, and Zinne (zin-nay), a pinnacle.

**ADHESION,**—In Building Construction. Means the result of joining two separate pieces of material of the same or different character by means of a third material, as a cement or glue or a mortar. It also includes the connection maintained by a body, as a pin or nail driven into timber. The principle of adhesion is of special value to the joiner and cabinet maker in gluing the pieces of their work together. It lies also at the base of all works in which cements and mortars are used in masonry, and pins and nails in carpentry. Some idea of the adhesive strength of an iron nail driven into wood may be had, when we state that one driven into dry oak to the



Acanthus Leaf.

length of the one piece, are perpendicular to the face of the joint, and of the other member parallel to the joint.

**ACANTHUS,**—In Architecture. A plant the leaves of which, treated in conventional manner form the distinguishing features of the capital of the Corinthian and Composite Orders in Classical architecture. The acanthus is the basis of a wide variety of ornamental forms used in the decoration of objects in art manufactures. Syn. Fr. Acante—pron. Ah-kanth: Ger. Barenklau which is the German equivalent of the English name of the acanthus plant—Bear's Breech, or "the breech of the bear"

depth of two inches will require a force of half a ton to pull it out. The adhesion of nails to wood is much influenced by the relation the nail has to the fibre of the wood. A nail driven into elm requires a force of 260 pounds to pull it out when driven endways—that is, parallel to the fibres—while it requires a force of 330 pounds to pull it out if driven sideways or at right angle to the fibres. If two pieces of wood are well glued together with ordinary glue, the adhesive force, being reckoned at 700 pounds to the square inch, is often much greater than the cohesive force of the wood itself, taken at 560 pounds, so that the wood may give way at its solid part before it gives way at the joint. Der.—from the Latin word “Adhoereo,” and this from ad, to and hoerere, to stick—to stick to. Syn. Fr. adhesion—pron. add-haze-ee-ong (from adherer (add-herr-eh) to adhere). Ger. Amhaften—pron. ann-haff-tane, to stick to (from anhaften, to grapple with, to clasp).

**ADJUST**.—In construction. To place one piece in relation to another so that when secured together they will lay in proper position. When two flat surfaces are to be adjusted they must be made perfectly true and “just”—as the technical term is, which is simply an abbreviation of the word adjust—so that no rocking or riding movement can take place, but the pressure will be equally distributed over the whole surfaces. The technical term “justifying” work is the act of making the pieces true and “just.” Der. from the Latin ad. to and justus, right, true and correct. Syn. Fr. Ajuster—pron. ah-jooze-tay, to adjust or fit together (adjustage) pron. ah-jooze-tajgh is the act of adjusting. Ger. Berichten—pron. bay-reegh (guttural sound) ten (Richt (reeght) right) to make right or correct.

**ADZE**.—In Carpentry. A tool bent or curved in face, with a sharp cutting edge fixed at right angles to the handle and at its lower extremity, so that the edge is towards the workman, who moves backward as the operation proceeds. It is used for roughing off or rendering partially flat and smooth the

surfaces of logs or bulks or large timbers. Syn. Fr. Herminette, pron. herr-me-nett: Ger. die Krummhlue—pron. dee croom-how-eh (krumm, crooked, bent or curved) from the verb krummen (crem-en) to bend, and Haue, a hoe, a mattock, from hauen, (how-een-or-ane) to hew, to cut, to chop or chip, as an adze does.)

**AGREEMENT**—or Contract. A document containing the terms of an arrangement or bargain relative to the purchase of land for the site of a building preliminary to the regular Deeds, or as to work of any kind to be done. Der. from the French verb agreer, pron. ah-gree-eh, to be in accord, of one mind, and this from gre, pron. gray, will, mal gre, equivalent to our phrase “will ye, nill ye,” i. e., whether you will or like or no. Syn. ‘Fr. Convention or Pacte, pron. kong-or kon-vahn-see-ong, pakt: Ger. Vertrag, pron. fare-trahg, and derived from tragen, to carry, to bear.

**AIGUILLE**.—In Architecture. A French term sometimes used in place of its English synonym Pinnacle (which see for derivation). This term is used chiefly in relation to Gothic achitecture, and denoted the pointed termination to certain parts in buttresses. They are in a Decorated stock especially beautiful as regards the ornamentation. The term Aiguille is simply the French word Aiguille, a needle, pron. Ah-gwell.

**AISLE**.—In Architecture. The side divisions or bays of a church, is distinguished from the body, nave, or central part. The term is derived from the French word aisle. Syn. Fr. le Bas-cote’, pron. bah-cot-tay (from bas, low and cote, a side); also the word Aile as above: Ger. Seitenschiff, pron. zite-enn-sheeff—from Seite (zite-eh), a side or flank, and Schiff a nave (also a ship).

**ALCOVE**.—In Architecture. A recessed portion of a building or a room, or garden buildings. In Continental countries where the alcove forms part of the room as affording a recess for a bed or couch, it is separated from the main apartment by pillars or pilasters, termed an Estrede, pron. Eh-strahd. Syn. Fr. Alcove, pron. all-kove: Ger. Alkoven, pron. All-kove-en.



# The One Man Shop

*Charles Cloukey*

## Third Article

THE use of the saw and dado head for making panelwork is illustrated in the accompanying drawing, and a few words of explanation will be sufficient to enable the operator to carry it off with pleasure and profit.

At "A" is shown the groove in the stiles and rails which can be made with a narrow grooving head, or it can be made with a common rip saw by setting the gage for the first cut and running all of the pieces over and then shifting the gage over the thickness of the saw and so on until the necessary width of groove has been reached. The tenons "B" are made with the saw by making a cut across the piece at the finished shoulder and as deep as required, and then turning the piece up on end and ripping off the sides. If the tenons are not so long as to prevent they can be made with the dado head, one side of the cutter making the finished shoulder, and then turning the piece over and making the cut on the other side. But this latter operation requires that the stock be all of an equal thickness or the thickness of the tenon will vary on account of working from both sides.

The tenons made by the use of the saw only are made with the face side of the stock turned to the fence or gage always, and then it does not matter if the pieces are not exactly the same thickness as they can be dressed off on the back side after being put together if necessary.

Perhaps it might be pertinent to say a word just here about laying out the panelwork, and without going into the subject exhaustively will say that after the stock has been cut and piled on the trestles ready for the cutting marks to be put on it, the various stiles and rails should be sorted out and paired up, where they have to go in pairs, and the face side and the face edges marked with some characteristic mark which the workman should always use so that it may not become confused with writing or marks not connected with the facing up of the stock.

To return to our panelwork, we note the mortise "C" which will have to be made with the hollow chisel mortiser which we have already mentioned as an accessory to the variety saw. The relish at "D" may be made by hand with a common hand saw, or if there are a great many of them it will save time to run them over the saw to make the short cut and then stand them on end and rip off the piece the long way. Of course if the tenon is short enough the relish can be made more quickly by passing it over the dado head, and it may even be quicker that way if it is necessary to make two cuts to get the necessary length.

It will be noticed at the relish "D," that a little corner of the tenon is left to fit into the groove "A" and thus reinforce the joint and fill up the groove in the stile below the mortise. In the case of screen frames or panels like those shown "J" the relish will have to be cut off close up to the shoulder unless one goes to the trouble to make a groove in the ends of the stiles just for this purpose. In the better class of panelwork this is often done, but for screens and the common run of work it is not necessary; but great care must be exercised not to let the saw take any wood off the shoulders or there will be an open joint just that far up from the bottom or down from the top.

At "F" is shown a flat panel which should be made of the proper thickness to fit the groove but not too tightly. Perhaps I should say that the groove should be made to fit the panel as we must keep in mind the fact that we have no surfacer to vary the thickness of our lumber except within the limits of our sawing capacity. But this is really true only for flat panels that are to show on both sides, as the panels may be sized all around the edges by running them over the saw with the face side next the fence and taking an evening cut off of the back.

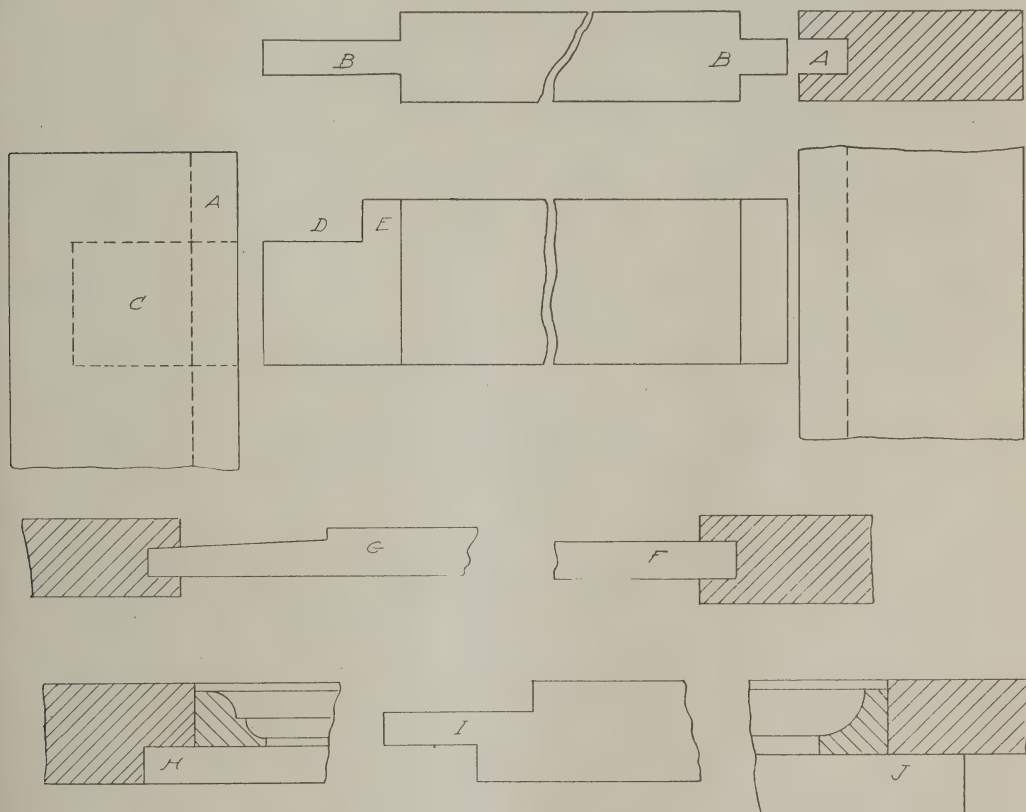
At "G" is shown a raised panel which can be made readily on the saw by putting on a false fence or gage wide enough to

support the panel and enable the operator to hold it steady. The table can then be tilted until the required bevel reached.

Another word of caution here about handling the stock will not be amiss, for it is important that the pieces be held steady and carried clear of the saw before beginning to turn or raise them from the table. The workman should begin with narrow

cut on the machine by the use of a fine saw and the mitre gages.

At "J" is shown the old fashioned panel frame with the panel nailed on the back and the moulding broken in from the face side. This is the same construction from the panel out as "H," but is not self contained like the latter. In other words it requires a certain amount more room than



cuts first, like the sizing of panels from the back as already mentioned, and then when he comes to the heavy cut necessary for a wide raise he can hold the work right without danger of spoiling it or of getting his hands cut.

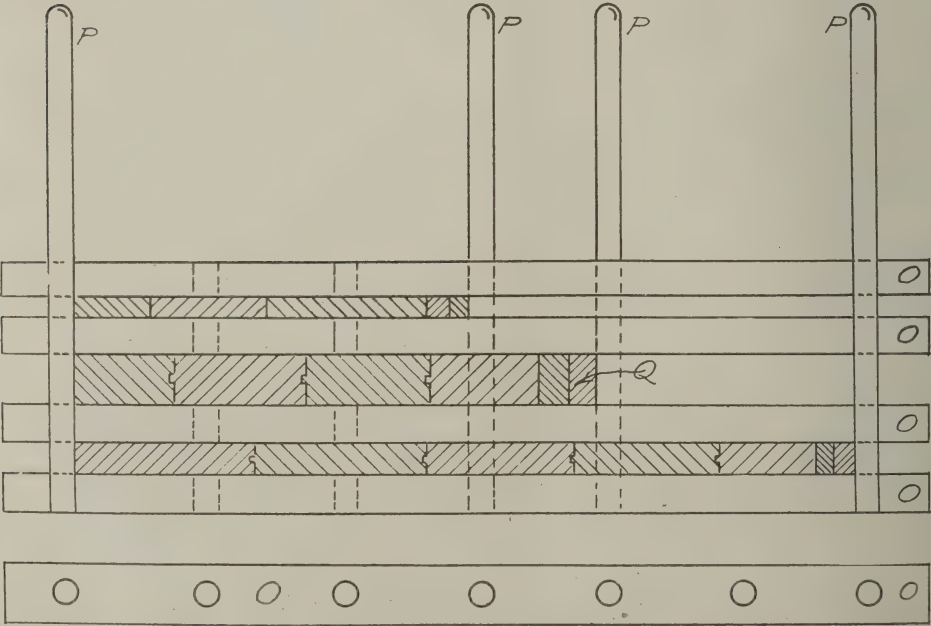
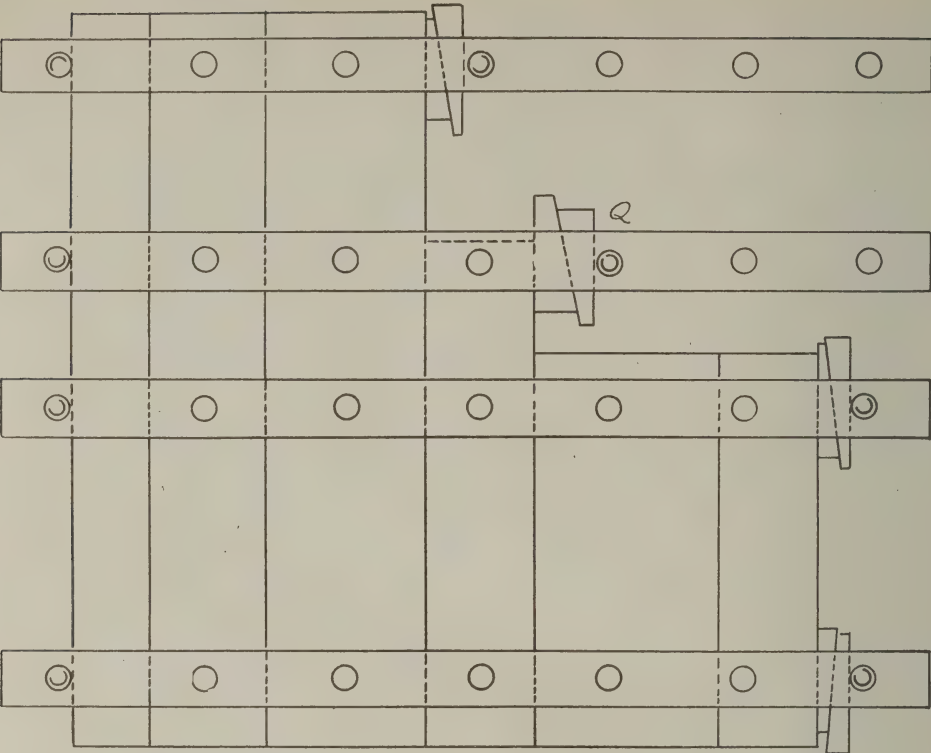
The panel shown at "F" is made with a rabbet instead of a groove and the mortise and tenon are made in the wider part of the edge and the tenon "I" shows what is called a "jump shoulder" or one in which there is an off-set in the shoulders of the tenon. The panel is then nailed in from the back and the mould mitred in from the face side. These moulding mitres can be

the other, but is used a good deal for store front work and other places where there is plenty of room behind.

The reader can now understand without further illustration that he can use a lip mould of any kind and spring by using one or the other of these three styles of frame and varying the shoulder to fit the moulding. And then his moulding may be varied by ripping off certain parts of the back so as to make the shoulder bigger or to change the spring or slant of the back, and still leave the face the same.

It is impossible to tell nearly all of the things which may be done on this simple





machine and I will try and content myself with calling attention to certain groups of operations and trust that after the workman has got an insight into the possibilities of his equipment he will adapt it to about all of his needs.

Fig. 2 illustrates a home made clamp for gluing up flat stock of any width or thickness and a little study of the cuts will show how the thing works.

The apparatus consists of but three parts; the flat or rectangular piece "O" with the holes to receive the sticks "P" and the wedges "Q" to drive the stock up to a good tight joint.

The edges of the stock are spread with glue and the first layer put on the sticks and the uprights put in so as to leave room for the wedges to start. Then the second stretcher is put on over the tops of the uprights and the second layer of the stock put down the same as the first.

A look at the drawings now will show that the stock may be of any length or width

but that each layer should be of approximately the same thickness, and if very thin should be the same so that it will not hump or buckle.

The holes and uprights may be square or the holes may be round and the sticks square just as may be handy. The stretchers are usually made about  $1\frac{1}{8}$  thick by  $3\frac{1}{2}$  wide and the uprights about  $1\frac{3}{8}$  square or round. The wedges should be about 8 in. long and of various widths and of two or three thicknesses so that they will not be thicker than the stock.

Some large concerns use this clamp for a general run of wide gluing and it is both cheap and lends itself to rapid work, and is especially adapted for one man work on account of holding the stock down automatically.

In the next paper I will take up the subject of sash making on the variety machine, together with some special gages, springs and guides.

(To be continued.)

## How to Estimate

*I. P. Hicks*

**A**LL our estimates are based on 50 cents an hour for carpenter labor. In some localities wages are higher than this and in some places lower, the 50 cent rate being a fair average and an easy rate to figure. If any other rate is wanted it can be easily figured out on a per cent basis, by adding or deducting as the case may require. For example if you want to increase the rate, every ten per cent added to the 50 cents will increase the rate 5 cents per hour, and every ten per cent deducted from the 50 cents will decrease the rate 5 cents per hour. This is such an easy method of calculating that any rate desired can be readily figured out by it.

BASES, BELT COURSES, CORNER BOARDS AND  
CORNICES

Figure 1 represents an outside base with water table and molding, a three-member base. The cost of labor for putting this in place on the building can be estimated as follows: For the wide member, 3c per lineal foot and 1c each for the smaller members, making a total of 5c per lineal foot.

Base courses are more often put up with

just a base and water table, when put up in this manner they can be figured at 4c per lineal foot.

This same design is frequently run across gables at the top of windows for a belt course. Whether used for a base or a belt course the cost can be figured the same.

Figure 2 represents a form sometimes used for a belt course. In this a furring piece is nailed on to the sheathing just above the mold, forming a swell in the belt course. Our sketch shows this sided which is more or less a difficult job. The corners have to be mitered and soft boards have to be selected to avoid splitting in the nailing. In all probability it is best to shingle this kind of a belt course, using a double course of shingles for the bottom course, and putting plain hip tins on the corners. Only once in our time did we ever side a job of this kind. Siding makes a smoother looking job but not a better one. The tendency of the siding to split is the one great drawback to using siding.

The cost for labor, using siding may be figured as follows: For the wide member



per lineal foot, 3c; mold and siding  $1\frac{1}{2}$ c for each member and 2c for the furring blocks, making a total cost of 11c per lineal foot.

If shingles are used figure  $2\frac{1}{2}$ c per foot for each course, counting the first double course as two courses, this would make the belt course figure 15c per lineal foot for shingles.

Figure 3 represents the most common form of construction in putting up corner boards. Both corner boards are of the same width and a quarter round is used in the angle. This makes a better job than nailing the corner boards together. The labor cost of this work on the job can be figured at 5c per lineal foot. If corner

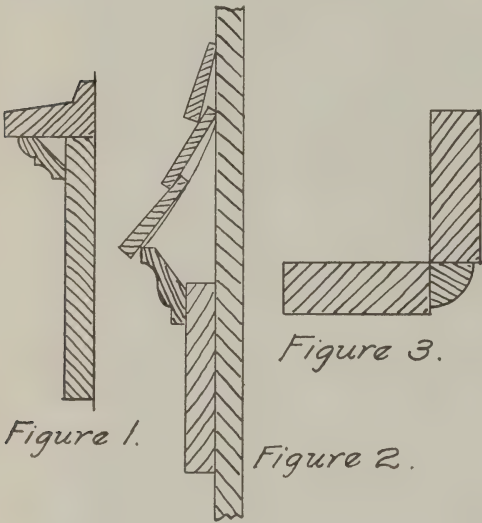


Figure 3.

Figure 1.

Figure 2.

boards are finished at the top where they join the frieze with a molded cap, add 15c to 20c for each corner.

Figure 4 represents the construction of a cornice much used on square, hip roof buildings. Beaded ceiling  $\frac{5}{8}$ x4 inches is much used for the planceer in cornices of this kind and similar. Such cornices require 4 boards for every foot in width and should be figured at  $1\frac{1}{4}$ c per lineal foot for each board; thus a cornice with a planceer one foot wide would figure 5c per lineal foot, two feet wide would figure 10c per lineal foot. The labor on a cornice similar to Figure 4 can be figured as follows: Planceer 10c, frieze 4c, fascia 2c, moldings 1c each, making a total of 18 cents per lineal foot.

Figure 5 represents another form of cornice used on houses of the square build. In

this the plate for the rafters sets out a ways on the lookouts as shown. When set in this way a 1x4 or 2x4 should be put in from the rafter down to the main plate to carry the weight of the roof. Another special feature of this cornice is the provision for setting the window frames up against the frieze. A wide frieze is often necessary in order to not have the frames come too high or too near the ceiling of the rooms when set in this manner. The frames are built without any outside head casing, the lower member of the frieze, water table and mold forming the head of the frame and a continuous finish around the cornice line.

The labor for this kind of a cornice can be estimated as follows: Lower member of frieze 2c, water table 1c, mold 1c, wide section of frieze 4c, bed mold 1c, planceer 10c, fascia 2c, crown mold 2c, cap piece 2c, gutter bottom 2c, making a total of 27 cents per lineal foot.

Figure 6 represents a form of cornice of the bungalow type. On this kind we have to estimate the frieze and bed mold at a little higher rate because the frieze has to be notched out for the rafters and the bed mold cut in between the rafters, thus making the progress of construction some slower on these two members. The other members in this cornice are as easy to get at as any style of cornice. The ceiling on this style of cornice being placed on top of the rafters makes this part easier of construction than the former methods. On this kind of cornice we can estimate the labor as follows: Frieze 6c; bed mold 2c; planceer, 11 boards at 1c per foot for each board, making 11c; fascia 1c; making a total of 20 cents per lineal foot.

Heavy verge boards usually go with the bungalow cornice, making the gable cornice of slightly different construction. This part of the work can be estimated as follows: Verge boards 5c per foot, planceer 10c, frieze 2c, crown mold 2c, bed mold 1c, making a total of 20 cents per lineal foot.

The labor for setting heavy bungalow gable brackets is worth 50 cents per bracket.

Figure 7 represents a cornice used in the construction of cottages and one and a half story gable houses. This design has a standing roof gutter, although this could be omitted from the roof and an eave gutter substituted in its place. This cornice has 2x4 lookouts nailed to the rafters and to

the sheathing on the house, in order to form a level planceer. This method drops the cornice down on the side of the building considerably and is not a good form to use where the cornice is over 18 inches wide. A double course of shingles must always be used to start with at the eaves and also in starting the first course of shingles above the gutter.

The labor for constructing a cornice to these details can be figured as follows:

sides at 3c per lineal foot for the labor of putting up the gutter strip and the gutter brackets.

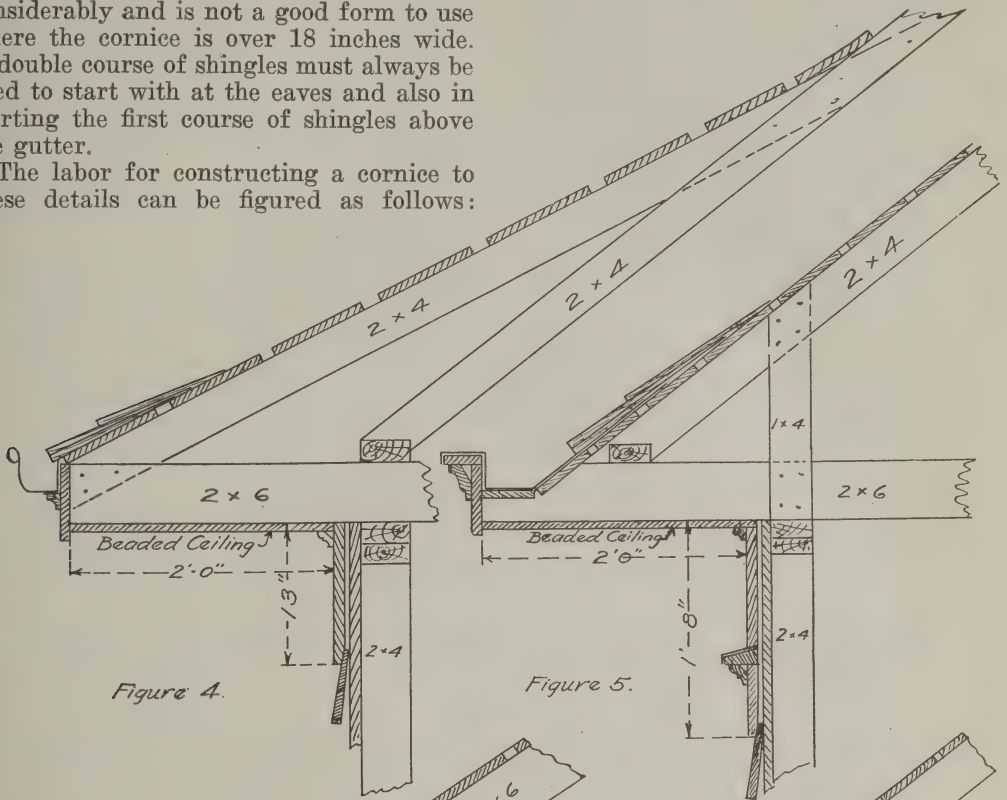


Figure 4.

Figure 5.

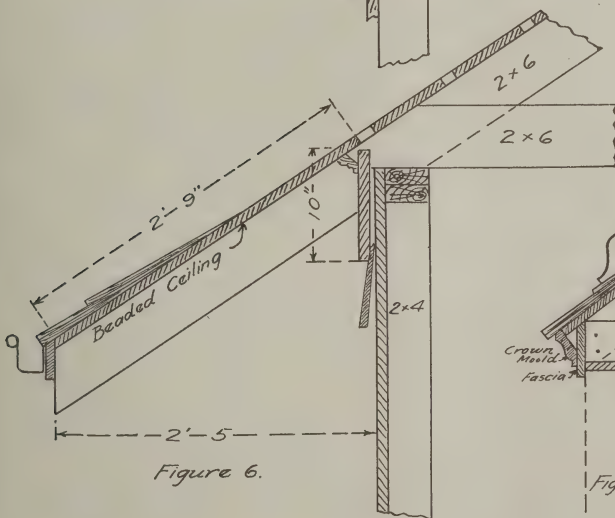


Figure 6.

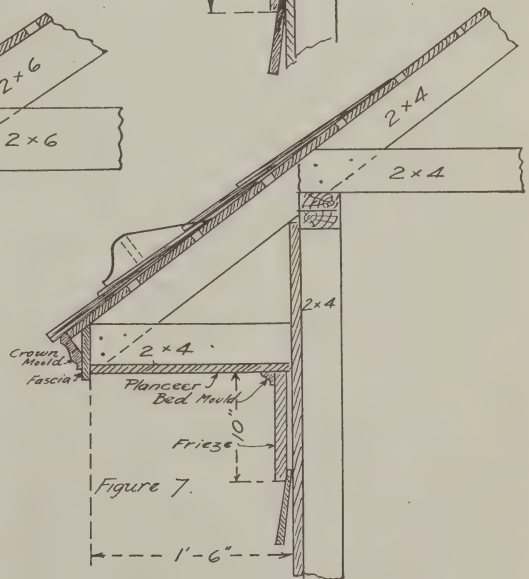


Figure 7.

Frieze 4c; planceer, 6 boards of ceiling 8c; fascia 2c; crown mold 2c; bed mold 1c; making a total of 17 cents per lineal foot. As there is no gutter on the gable ends, estimate the gutter separately on the gutter

#### ESTIMATING THE MATERIAL

We will now take up the matter of estimating the material required for bases, belt courses, corner boards and cornices. First, take the plans and go over them and find



the lineal feet base, belt courses, corner boards, etc., making a note of the dimensions of the different materials required. On finish lumber it is not a good plan to order so many lineal feet and leave it to the lumberman to send you any old lengths of material; this always leads up to more waste. Decide on some lengths that you can use to advantage and figure out the number of boards you will require. For example, suppose you should have 164 lineal feet of 8 inch base, you could figure like this:

5 boards 1x8x16 ft.....	80 lineal feet
7 boards 1x8x12 ft.....	84 lineal feet

Total.....164 lineal feet

To this always add 1 board to every 8 or 10 boards figured because it will take this amount to make up for the waste in cutting and fitting on the average job.

On corner boards find the lineal feet of corners requiring corner boards and double the amount because it takes two boards to

(To be continued.)

each corner. Always throw in a board or two for good measure for the chances are about two to one that you will need it before you get through with the work.

On cornice, go over the plans and take down the lineal feet of each kind separately, as main cornice, dormer cornice, bay window and porch cornices, noting the dimensions of material required in each case; then figure out the number and lengths of finish boards required in the same manner as described before.

On the planceer where beaded ceiling is used, multiply the lineal feet by the width of the cornice in feet and fractional parts of a foot when there are such. For example, if the cornice is 20 inches wide, you multiply the lineal feet by  $1\frac{2}{3}$  because the 20 inches is  $1\frac{2}{3}$  feet. This will give you the net square feet, but you have to allow for the matching and for some waste in the cutting. To compensate for this you should add 30 per cent to the net measurement.

# Painting Structural Iron Work

## A. Ashmun Kelly

**F**ORMERLY, and even yet, to a large extent, it has been the practise to give structural steel a coat of some alleged protective paint, but many architects and building engineers prefer having the metal delivered uncoated. There is much to say in favor of this latter plan. First, the exposure for a time to the weather frees it from much of its loose scale. Then the painting done at the mill is usually done by unskilled labor, and the paint is therefore not properly applied, the uncleaned metal is covered up so that it cannot be inspected. It needs not be said here that the metal must be made perfectly clean before any coating is applied. The prime coat should be applied just before assembling the parts.

Rust and scale must be removed. Rust will continue even under paint, so that it must be removed. If the metal is allowed to stand exposed to the weather too long it is apt to rust, so that is why it should be painted before assembling the parts. Then the painting can be under the supervision of the architect or other person on the work and having supervision. And it

is important that the paint be applied while the metal is dry, and if it were possible, when the metal is not too cold.

The coating should be heavy, rather than light, because, in general terms, the measure of protection afforded by a paint is proportional to its thickness, granting that the film is hard, elastic and adhesive. And there should be harder brushing in of the paint than on any other surface, because of the non-porous character of metal, this rubbing in causing the paint to adhere better.

The reason for having a thick paint film is, that it will keep out moisture better than a thinner coat, and the more pigment the better the protection; linseed oil not being moisture-proof. Linseed oil alone when applied to metal affords almost no protection at all; yet when red lead is mixed with it we get a paint that is nearly ideal. Such paint is hard, yet elastic, thick and very adhesive. It is possible to mix as much as 33 pounds of dry red lead to a gallon of oil and get a good paint, one containing the maximum of pigment. In fact, it is the paint for iron or steel work of all kinds. It is an inhibitor of rust, and is so dense

a coating that water will not penetrate it, though it will any ordinary oil and white lead paint. Navy vessels are coated with it, the mammoth steel members, as well as all minor members, of the Panama canal are coated with it; in fact, practically all structural steel is coated with it. Engineers and chemists agree that at least two coats of red lead paint should first be applied, after which any purely decorative paint may be given.

When painting metal work it is a good plan to make each red lead coat a little different in shade, by adding some lampblack to one coat. In this way the inspector can detect any faulty work. The lampblack will not do any harm, but is rather a valuable addition to the paint.

To prepare the metal for painting the surface must be freed from scale, moisture, grease and rust. This can be done with benzine for washing off grease, and with steel wire brushes for removing mill scale. Any holes, large or minute, should be filled with a proper putty before painting. Be careful to paint all parts, for if the metal is allowed to touch, face to face, rust will follow. Local galvanic action is excited, causing the corrosion.

When it is necessary to repaint structural steel work the work should never be done in winter, or in wet weather. Take as dry and warm a time as you can. The cleaning off of the metal must be very thorough, removing all rust or scaly paint, etc. All rusty parts, or where the paint has come off, should be made clean and given a coat of red lead paint, after which the entire surface may be painted with any desired paint. For repainting such sur-

faces we would advise the addition to the paint, made with raw oil as the chief thinner, a little benzol or turpentine. This for the first coat only, though turpentine in a small amount will do no harm on any coat, only it is apt to dull an oil finish if in excess, though it will make a paint much harder. Benzol being a solvent of oil, is not advised on any but the priming coat.

Another very good pigment for iron or steel work is iron oxide, though the red lead paint is the very best for contact with the metal, after which the iron paint may be applied, if its color is not objectionable, and this may be modified with lampblack. Oxides do well in paint subject to much exposure, hence iron oxide and lead oxide (red lead) are good pigments. Zinc white is an oxide, true, and a very desirable pigment or base, but it is too hard, is non-elastic, hence does well only in connection with another pigment having more elasticity, like white lead.

Red lead paint should be mixed and used the same day, as it oxidizes so readily that as a paint it soon forms a cement; besides which it settles in the pot, though there is some red leads that do not settle very much if at all. Mix with raw linseed oil, the following being a typical formula: To 100 pounds dry red lead, add, for summer painting, 4 gallons raw oil, and for winter painting use boiled oil; add also in either case 1 gallon turpentine, and  $\frac{1}{2}$  gallon japan driers for the raw oil, none for the boiled oil. By adding 10 ounces dry lampblack to the 12 pounds of dry red lead, which oil to make a gallon of paint, you will get a colored red lead paint previously mentioned.

## The Detached House

*Jas. Casey*

**I**T IS a source of unending surprise to the uninitiated, the amount of variety that can be obtained by the skillful architect and builder by the judicious handling of his materials, few and simple though these may be.

As a matter of fact there is nothing surprising about the thing at all, to one in any way acquainted with the mysteries of figures and the endless combinations that can be obtained from even a strictly limited

number of forms. The art of depth and appropriate combination explains the seeming mystery.

This art, simple as it is as to fundamentals, is none the less a supreme and difficult art; and the builder who would succeed in its application—and the application is the all of it from the viewpoint of the practical business man having a single eye to results—must pursue it systematically and diligently, and in doing so, he must study the



popular taste, both in respect to time and place.

Here, as will be seen, there is a two-fold combination; or if preferred that way, there are two orders of combination, acting and reacting upon each other. The more obvious combination of materials presented under appropriate forms; and a more subtle combination that is mainly artistic, but which has none the less a distinctly business end in view; in other words, the securing of a satisfactory purchaser or tenant.

The house illustrated stands detached in

country, and promises to remain so. In order to secure this continuity of favor it is essential that the construction should be good of its kind, the wood duly seasoned and properly colored. Above all, the exterior plastering must be done by a skilled workman who understands his materials and applies them in the right way.

Nothing is more unpleasant to the sight than a plaster exterior shrinking away from its timbers, and generally falling into decay. The surest security against any such deplorable lapse as that is to pay particular



A Stucco House Blends Well with the Winter Snow.

its own grounds. In a house of this description all aspects have to be considered, and as a consequence must be architecturally treated. As a whole nothing is more disappointing, more particularly in a select neighborhood, than to see a good front elevation marred by being brought suddenly into contact with a mean return. It must be constantly borne in mind in this connection, that a detached house is never seen only from one viewpoint. Once this fact is universally recognized, the one-aspect house will disappear, at least where good taste prevails and is called for.

The exterior is of the half-timber variety, of the usual kind where price is a controlling consideration. This style is just now extremely popular in many parts of the

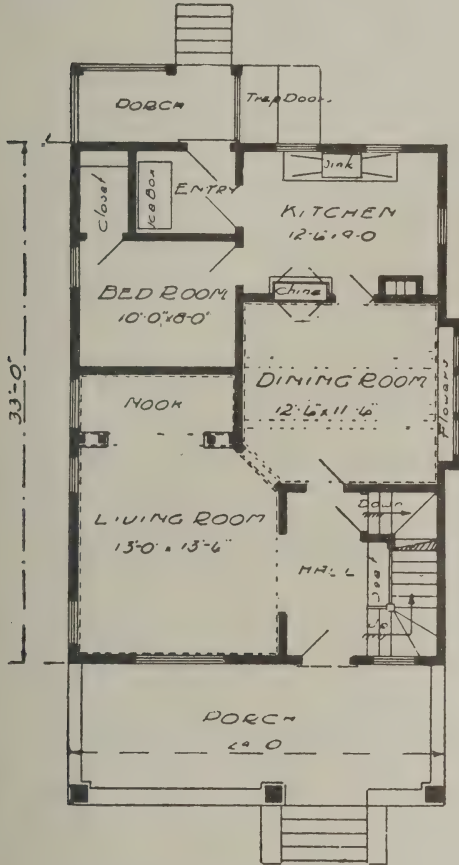
attention, in this order of work, to the matters of good lumber, good cement, and honest workmanship at all stages of the game.

The ground plan is extremely neat, and compact. The hall, with its seat, is a feature. It is also a convenience.

The living room and the dining, which are upon opposite sides of the house, connect diagonally. This feature will appeal to many and deserves noting. Another feature is the nook provided in the rear of the living room. A nook of this description can be turned to account in many ways, both ornamental and useful.

The kitchen is immediately in the rear of the dining room, the obvious place for it. Opening upon the kitchen is a small bedroom, provided with a closet. The rear en-

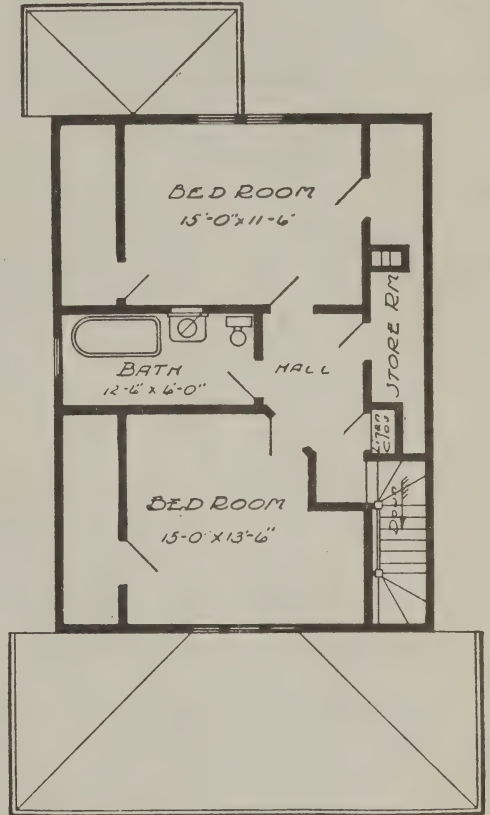
trance is enclosed and is provided with an ice-box, which admits of being filled without encroaching upon the domesticity of the kitchen. This observation applies more particularly to the smaller towns and residential districts, where neighbors are often apt to be unduly curious, and have all too ample leisure for being so. The greater the privacy, the more cosy and comfortable the home.



FIRST STORY PLAN

certain problems which the practical builder is constantly called upon to deal with in the pursuit of his calling, they are well worth a few lines of criticism.

The bedrooms are, as already stated, of good size. This result is secured in the way shown upon the plan. The medial, or central disposal of the rooms secures at the same time quite a number of other desirable ends, as for example, good headway, large



SECOND STORY PLAN

The ground plan here given is a well contained whole. Everything is keyed so to speak into everything else. The entire thing is a combination, as such it is presented and commended.

The second floor contains two good-sized bedrooms and a bathroom, also linen closet and a long, narrow storeroom, running in the rear of the stairs.

The arrangement of this floor induces a variety of reflections, and as they concern

windows, carried well up to the ceiling thus admitting of ample light and ventilation. Finally, there are the extra closets, and the rangy storeroom already adverted to.

The matter may be put another way, thus: the bedrooms have the benefit of the full height of the floor; and the conveniences are compactly disposed of under the eaves. No space is wasted.

This is the ideal arrangement for the small home with gables, front and back.



# Store Fronts

*Chas. P. Rawson, Architect*

**H**EREWITH we show three more store fronts, the final ones of the series. All are drawn to the scale of one quarter inch equals one foot.

The front shown in Figure 1 is a double one of the minimum width of thirty feet. It may be any width up to fifty feet, and the underlying principles of this style of front would remain the same, and the front constructed with an assurance of success. These windows are arranged for either a furniture, novelty or dry-goods store and consists of four compartments. If the building has plenty of depth and more space is required, the rear compartments could be made deeper. The space between the compartments from front to rear should never be less than four and one-half feet, and the space between the two front compartments nine feet. These distances are of vital importance. The opening into the front compartments are through glass doors, with metal frames built into the rear plates and should be at least four feet wide. The ceilings over the compartments and over the spaces between them should be panelled in squares. The upper part of the front is of sheet prism glass and the base is of marble. Any kind of metal store front construction may be used in this window. The backs of the compartments may be of wood paneling or of mirrors. The wall space between the front and rear windows should be filled with mirrors.

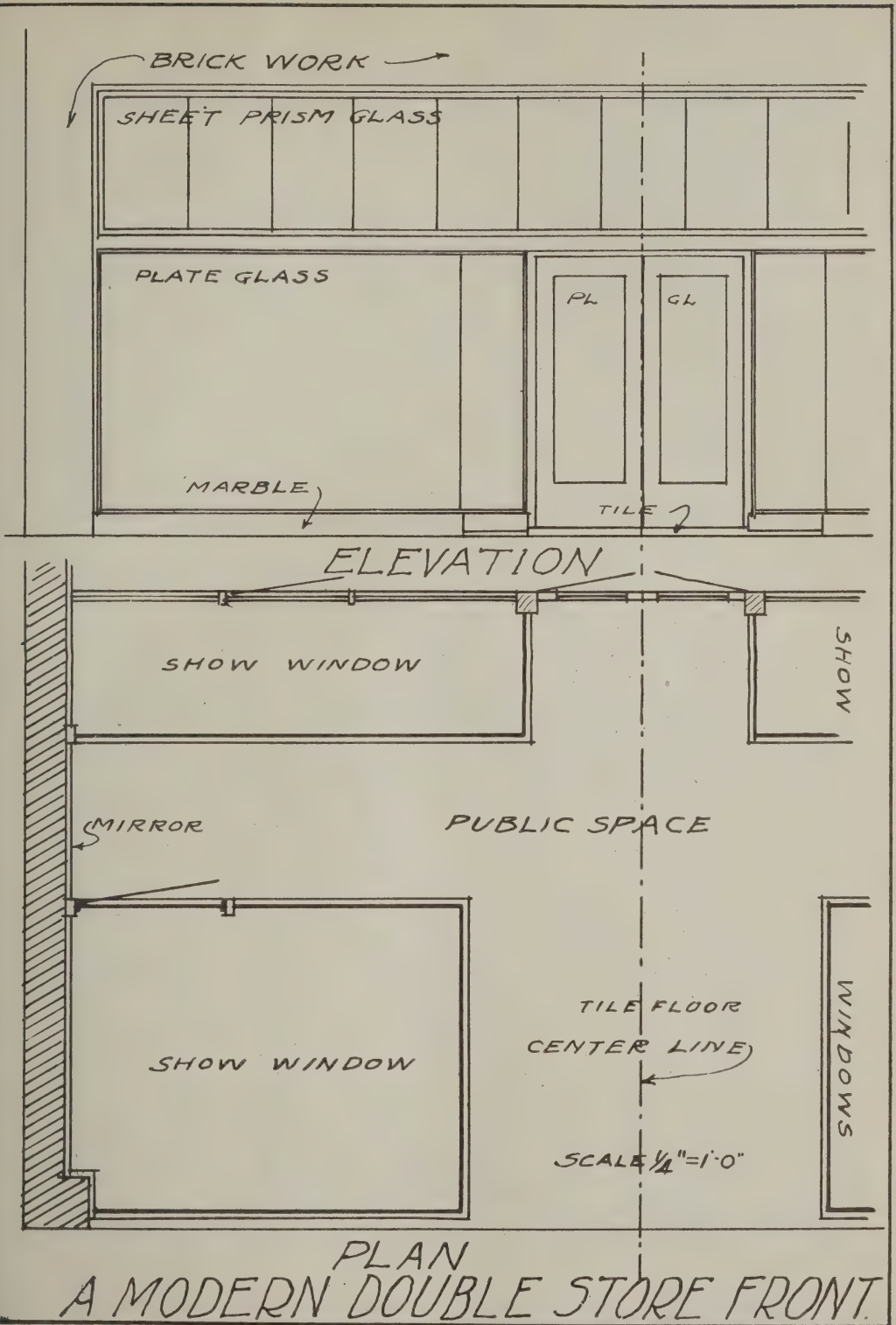
The second drawing shown is that of a front adapted for use in a jewelry store and is twenty feet wide although it could, of course, be adjusted to a different width. This front will appeal at once to jewelers on account of its modern appearance and its adaptability to their line of business. The opening of the vestibule is wide and yet there is no sacrifice of window space. This front seems to fulfill to the greatest extent, the true mission of the display window—to cause people to enter the store, it seems to be easier to go in than to go by. A jewelry front should be rich in detail. Metal construction should be used and a marble base is almost necessary. The upper transom

should be of leaded prisms. If the back can be made of art glass, it will add greatly to the appearance. The ceiling should be paneled in wood and the sides in mirrors.

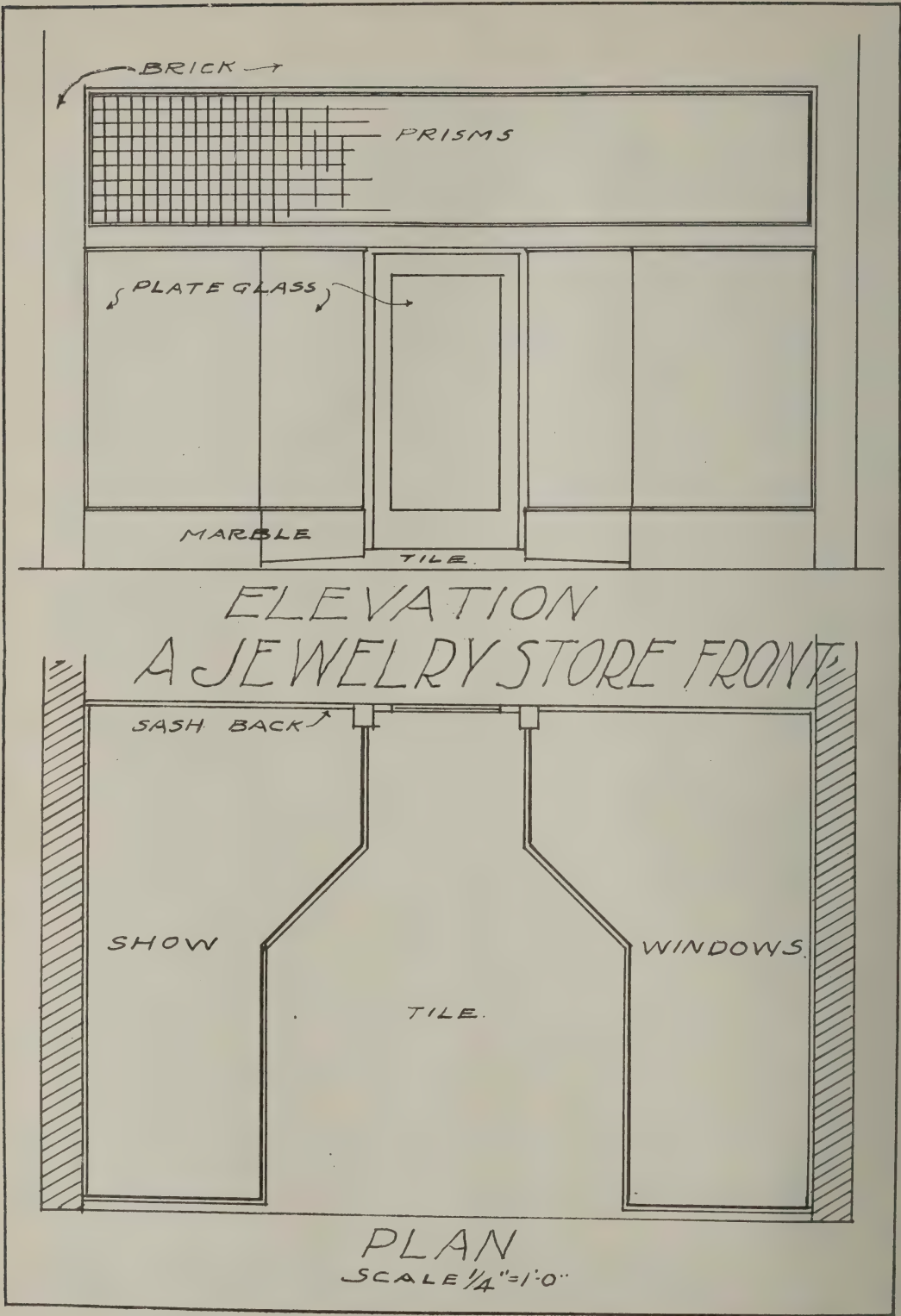
The third drawing illustrates the method now largely in use of remodeling an old front so as to make an outside entrance to the basement. This treatment is used largely for saloons, restaurants, etc., where but little display window space is required but where the entrance must be conspicuous. In cases of this kind it is not necessary to take out the two iron posts which are usually found in old fronts. This, of course, greatly cuts the expense of remodeling. The best way is to install door and window frames of plank and then to cover the entire front with thin (usually quarter inch thick) sheets of iron screwed securely to the wooden frames.

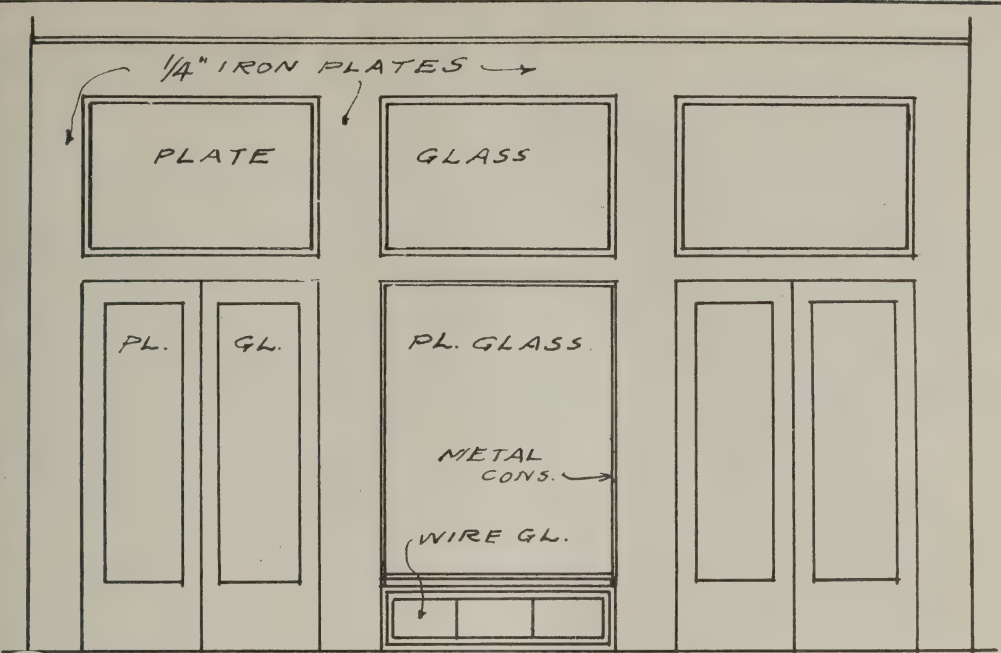
In some cases this covering is made with metal lath and stucco or white glazed tile. Stairs to the basement are built inside the store space. The stairway may be made as plain or as elaborate as desired. The steps and walls may be lined entirely with marble.

The greatest problem for the merchant to decide is the type of store front that his own particular business needs. It is a matter for decision by the commercial rather than the mechanical mind. Any contractor can build a front that will be weather-proof, but it takes a business mind to design a front which will produce sales and this is the sole reason for a display window. There is no such thing as a prevailing style in store fronts for those merchants who are making big money on their store front investments. Finally the question of cost is one that can only be answered when each individual case is considered. All the way through it is simply a matter of deciding on what is wanted and then paying for it. It is a matter of investment. If properly designed it will pay and pay well. There are hundreds of cases where a new front in an old building has paid for itself in a few months. Is there any better proposition to put before a merchant?



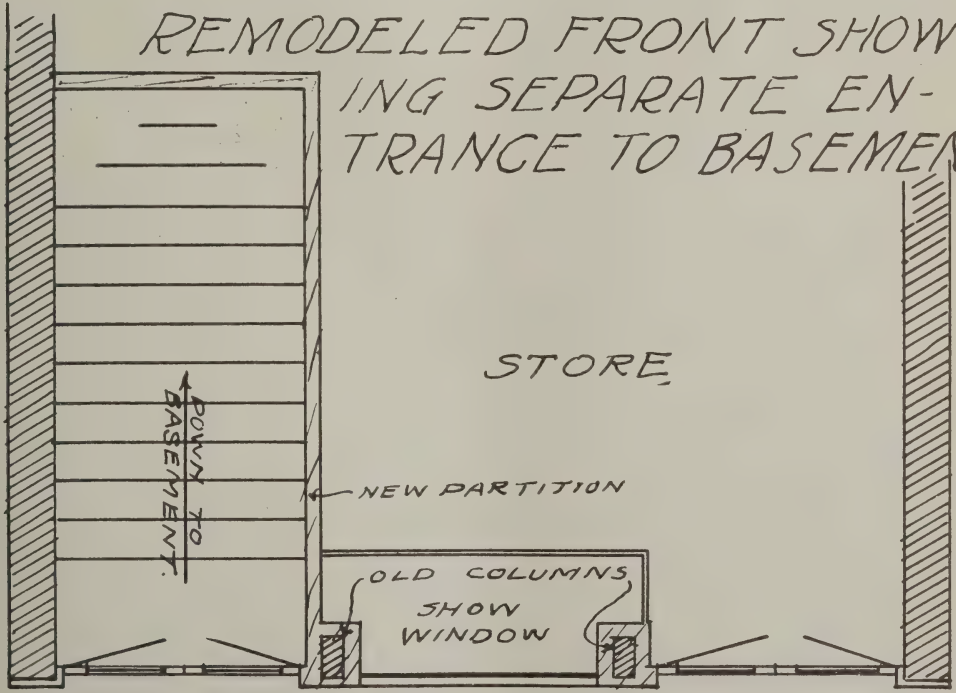






ELEVATION

REMODELED FRONT SHOW-  
ING SEPARATE EN-  
TRANCE TO BASEMENT.



PLAN  
SCALE  $\frac{1}{4}$ "=1'-0"



# Attracting the Farmers' Attention

**C**URIOSITY is one of the failings of every right minded human being. Indeed it is a failing of many of the lower animals too, so mere man need not feel lonesome about it. Curiosity is more-over one of the qualities the contractor should humor in his clients and always keep them looking for something new in his shop and office.

In a farming community, the contractor has a great advantage over his city brother, for every farmer is just naturally curious to search out every new invention, every new process which promises to make work easier, or two apple trees to flourish where one hazel bush grew before.

We read about the city people buying gold bricks, mining stock and other worthless swindles, while the farmer is cutting his eye-teeth on lightning rods, nursery stock, etc. The farmer *knows* the lightning rod is a good thing, and nursing stock must be purchased, and never thinks he is getting the best of anybody. He is just curious about the new things, new plants, etc.

So when the contractor passes the word around that he has something of interest to the farmer, it isn't long before there is a string of milk wagons in front of his place. If the contractor has made a study of the farmer and his problems, it isn't long before the contractor's truck glides into the farmer's yard with a load of stable fixtures, ventilators, screens, and even the whole equipment for everything from root cellar to silo. Unless the contractor knows his business, the farmer's curiosity will soon be satisfied and someone else with more knowledge will get the farmer's business.

The last few years have seen a big change in the farmer's business. The scientist discovered that there was a difference in milk and dairy products. Everyone else knew right along that some milk kept sweet longer than some other, but when it was proven that the farmer had anything to do with it there was a demand for the best, and some kinds of alleged farming went into disrepute. Then the scientist found there was actually a real difference in breeds, and in animals, and the result is the "agriculturists" have developed the

cow giving 15 tons of milk a year and bulls selling for \$20,000 at three months of age. Where does the farmer come in? Unless he is in that class he has no business talking back to the contractor who tells him to fix up his buildings, for unless the buildings are in shape, he cannot break in. No one need tell the average farmer that blood will tell, for he has the evidence of it before him all the time. Nor need he be told that his buildings must be sanitary, well-ventilated and clean, and large enough to care for his herd. The farmer does not need to be told this, but the contractor does. When the contractor realizes the farmer's problems, the start is made toward a lucrative business. The contractor can suggest and devise plans for overcoming the farmer's troubles, save his labor, and bring him greater returns.

## THE CREAMERY INSPECTOR

If he is in a dairy country, the contractor's best friend is the dairy inspector. He can talk turkey to the farmer, and can sow the seed for the contractor. He can, if he will, tip off to the contractor just what each farmer in his district needs and should have. The average farmer will do a lot of work and spend a lot of money to insure his milk being taken at the creamery and the contractor should be on hand to show him the most economical way. Cultivate the inspector's acquaintance.

## SOME OF THE PROBLEMS

Among the items which hamper the farmer are cleanliness, ventilation, light, water supplies, care of milk and other products and transportation. These all dovetail so that no one can be termed the most important, for the failure of any one is a serious matter. There are other items which will occur to the observant contractor and he should keep his eyes open for new things. The sooner he can pass them on to the farmer, the better his reputation will be. Often the suggestions will be unheeded apparently, but the time comes when the farmer wants information and there should be no question as to where he should go. The contractor's office should be a

clearing house of ideas for the farmer and the contractor should know just as much about haycarriers and cooling tanks as he does about front door locks and medicine cabinets.

#### WHAT THE CONTRACTOR SHOULD KNOW

The contractor is a specialist and a specialist who should know everyone else's business as well as they do and his own a whole lot better than the average. This seems like a big undertaking, but it isn't as much as it seems if the contractor keeps the requirements before him, and takes advantage of his opportunities. A good farm paper will give him a mighty good idea of the farming problems, a poultry paper will post him on fresh air sleeping porches for fowls, and show him the difference between a trap-nest and an incubator. If the farmer comes to him and wants a house just so big, or a barn or anything else, and knows just what he wants, the contractor should be ashamed of himself, for he has been asleep while the farmer drew plans and made estimates, a difficult task to him. The contractor should have the farmers listening to him and the contractors who are talking hard times should talk hens, and sheep, and calves, and pigs, and then about machinery sheds, and a thousand other things about the farm. It is a safe

bet that every NATIONAL BUILDER reader knows where there is a thousand dollar threshing machine exposed to the weather. What would happen to a woman who left her sewing machine out on the back porch, just because she used it there last and might want to use it there again next summer. What's that, you left your concrete mixer out in the yard last fall and it's all rusty now? Well, we'll excuse you while you clean it up if you will promise to talk machinery shelters to the farmers for the next few weeks. Don't forget to have some practical ideas on shelters and sheds however, for you must be posted when you are asked for a remedy.

#### HOW TO GET INFORMATION

The advertising pages of THE NATIONAL BUILDER are full of new things and good things for the contractor and the farmer. Unless you have the catalog of every advertiser you are not doing your full duty to humanity. Ideas you can get for a postal card will post you on important subjects, keep you out of trouble, and make you the oracle of the building trade. You don't believe it? That's just because you haven't tried it.

Primarily, the contractor is a master builder. Practically, a great many are not masters at all, but just in the straw boss



A Study for a Suburban Home.

H. H. Zimmerman, Architect



class. They keep their noses so close to the grindstone that they don't see, out the window, the procession of customers going to the competitor. The competitor probably has a catalog file, a sample cabinet and a reading table covered with trade and technical papers of interest to his men and his customers. And every once in a while the contractor is told, "It is so, for I saw it in a paper at Jim Jackplane's office."

#### HOW TO EDUCATE THE FARMER

Now don't get an idea that because a man lives in the country he isn't posted, at least on his own business. He has more time to read, perhaps, and so is a better student. He is more prominent, for his big, red barns are easier seen than a city apartment or cottage. Everybody knows him and he does a lot of talking when he goes to town or even over the phone. The mail man calls regularly and leaves the local papers as well as the farm papers and national magazines. The farmer keeps posted, he has to, but he won't do much building unless the contractor gets after him and can talk intelligently about the contemplated work. When the contractor shows that he knows what he is talking about the farmer will listen. And it is not much of a job to convince him that the new buildings or equipment will be a good thing for him. He knows that already, so it only remains to show that the particular plan the contractor has in mind is the most practical and that it comes within the limits of the farmer's purse.

Before the contractor is ready to make his talk to the farmer, he must study the individual problem as well as the general subject. The actual number of cows, or pigs, or sheep or chickens, will furnish him a guide to the general proposition. The fact that he has a plan laid out will help him a whole lot with the farmer, for it will show a little foresight, and a farmer knows that the man who lays out his work carefully before starting will not have to make many hurry-up trips to the lumber yard for things he forgot, or be delayed through failure to order special equipment, etc.

One should never overlook the advertising possibilities of a farm job. With few buildings to obstruct the view, the contractor's sign during erection will be seen by every farmer passing the place. The con-

tractor's auto truck with a sign painted to port and starboard, fore and aft, will be seen and talked about. It won't be necessary to break any speed laws to attract attention, everyone will see him.

But above all, get the farmer's habit of investigating anything not fully understood. Get the catalogs, get the booklets, get all the information you can. Study them and leave them around where your men and your customers can see them. If anyone thinks enough of a catalog to take it away with them, accidentally, of course, send for another. Tell your troubles to the specialists in that line, or to THE NATIONAL BUILDER staff, and you will be surprised to see how prompt and complete the answers will be.

It seems as if, in these days, everyone is just dead anxious to please, and will go a long way to help anyone. There is always the hope that it will lead to business, of course, or it wouldn't be done, and there is no telling when a little apparently free information will bring a good customer.

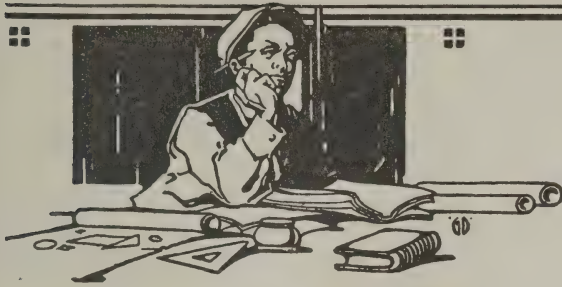
Be just curious enough to ask a few questions, too. Learn all you can about the prospect's business, if you don't know him already. Get him to talking and he will tell you many things you can use. Head him around to the neighbors too. He probably knows them better than you do and can explain their peculiarities and indicate the way to their business too.

Some men like to talk their own business. Listen when they do, and let them know you are in business too. It is not necessary to "blow your own horn" very much, when a man comes to you, but rather let him get and keep the idea that you are the one man who can do his work right at the right price. You can make him a "booster" for you if you cultivate his curiosity right.

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A provision in a building contract that "the work shall be understood to be accepted when the engineer shall certify \* \* \* that the said work \* \* \* has been completed," does not make the final certificate of the engineer a condition precedent to the contractor's right to payment, where the work has been accepted or the contractor has substantially performed his contract.—*Clement v. Didier-March Co.* 90 A. (Pa.) 927.

# OUR READERS PAGES



[The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessarily for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experience will be given proper space.—Ed.]

## Answers

### A TRUE LEVEL

From "A. P. W." in answer to "W. P. B."

Your questions are just like everyone elses. A good level is a fine companion while a poor one is worse than useless as it leads you into errors when you are trying your best to avoid them.

Levels will get out and go wrong even when locked in a tool box, and the very mischief gets into some of them sometimes. The best way is to test them often, and this is easily done.

Select a solid bench, and nail a small block on it. About an inch away drive in a flat head screw so that it sticks up about a quarter of an inch. Near the other end of your level, when resting against the block, drive in another screw. The object of the block is to make sure you have the level in exactly the same place every time you test it.

Note where the bubble comes in the tube. Reverse the level and note the bubble again. If it comes exactly in the center both times your level is true, and the heads of the screws are level also. About once in a million this happens. If the bubble goes to the left both times, the screws are not level. If it goes to the left first, and to the right when you reverse it, the screws are level, or nearly so and the bubble glass or tube is not level and must be corrected.

First work the screws up or down until the error of the bubble is the same when either end is held against the block, that is, so the bubble is always toward the same end of the level.

You now have a level line, the tops of the screws. If your level is adjustable,

correct about one-half the error and reverse, making corrections a little at a time until correct both ways.

But if your level is one of the older styles, you will have to take the vial out and this must be carefully done, as the glass is thin. Clean out all the plaster of paris, and wrap a coarse string around the vial before setting it back. This will hold it in place until you get it right. Raise or lower one end or the other until the bubble centers both ways, and then pour in plaster of paris mixed with water enough to make it like thick cream. Be careful not to disturb the setting of the vial or it will all have to be done over again. Trim off the surplus plaster and string after the plaster is set, but before it is dry.

The vial is curved, be sure to have the crowning side up and keep it as high in the frame as possible for easy reading.

Practically the same process is followed in testing the plumb. Be sure the sides, top and bottom are parallel, and then put your block on any solid vertical surface with the two screws above it.

Don't be satisfied with anything less than perfection in your levels. You cannot appreciate the comfort of a good level until you have checked one up and found it absolutely right.

### WORKMEN'S COMPENSATION LAW

From "S. H. G.," Chicago:

In answer to O. M. of Augusta, Ill., the Workmen's Compensation Law of this State applies to every building contractor regardless of the number of employees. It is im-



material under this law whether the work is done by day or job agreement. The contractor is responsible for compensation to all of his employes unless he has filed a written rejection of the compensation provision of the Act with the Illinois Industrial Board. Furthermore, it is immaterial whether the accident occurs through the carelessness of the injured workman or through the carelessness of another employe. An exception exists only where the injury is caused by the employe through his wilful intention to cause the injury.

The law specifically prohibits an employer from deducting the cost of insurance from the wages of the workmen.

The chief features of compensation consists of the payment of all medical and hospital services necessary during the first eight weeks of disability, a limit of \$200 in each case, and one half wages for each week of disability exclusive of the first week, for as long as the disability lasts, not in excess of eight years. Minimum amount \$5.00 a week, maximum amount \$12.00 a week. For loss of life four years' average annual earnings.

#### HOW LIME BRICK IS MADE

From "A. S. W.," Rochester:

In answer to S. T. R., New Jersey, lime brick or sand-lime brick are made from sand and lime, the exact proportions depending on the quality of the materials. The general process consists of drying sand and mixing with the pulverized lime. Enough water is added to just slake the lime and the mixture is stirred while slaking. In this way the lime combines chemically with the sand to form silicate of lime. Enough more water is added to allow molding, usually under heavy pressure, after which the brick are cured in a kiln or cylinder containing steam under high pressure.

There are several companies making apparatus and equipment for making these bricks and if S. T. R. cannot locate them, he had better send his name to the Editor for further information.

#### POWER MACHINERY

From "A Woodworker," Detroit, Mich.:

Answering W. T. R., Blytheville, Ark., I do not know what he means by doing "stunts" but, I may say, if he has a good saw rig he should be able to do most any-

thing with it, that can be done with any other circular saw rig, if he has power enough. To explain to him how to arrange his saw, so that he can plough with it, tongue and groove, cut out bevel edges, route, and do other things would take up more space than I will be allowed here. If he will tell me in these pages just what he wants to do with his saw, I may try and help him out. I would advise W. T. R. to subscribe for *The Woodworker*, Indianapolis, Ind. He will find many "methods and kinks" described and explained, along with other useful information.

#### COST DATA

From "Contractor," Cleveland, Ohio:

R. S. C. of Ontario asks a question, or rather a "bunch" of questions, that are difficult to answer, as much depends on the locality. He ought to keep a daily account of expenses and receipts for a given period, and then average these figures per day, for the period and this will give him some idea to work upon. The longer the period, the more correct the averages will be. The profits should be at least 10 per cent of the output after making all provisions for cost of plant, materials, insurance and depreciation of the plant. There is a book published by Myron C. Clark Publishing Co., Chicago, entitled "Handbook of Cost Data," by Gillette, price \$5.00, which deals with this, and other similar subjects, which R. S. G. might find extremely useful.

#### APPRENTICESHIP

From "Workman," Chicago, Ill.:

E. A. L. of this city should engage himself to some successful contractor to work for a low salary for at least a year. He would have to rough it for a little while, but he would acquire a great deal of knowledge, if he keeps his eyes and ears open, and with his present knowledge would soon be able to qualify as a contractor. Going easy, and slow at first, studying estimating and the way to be successful will soon dawn upon him if he possesses ordinary abilities. Everything, almost, will depend on himself.

#### ROOF TILING

From "Tiler and Thatcher," Newark, N. J.:

Having been employed at this work in

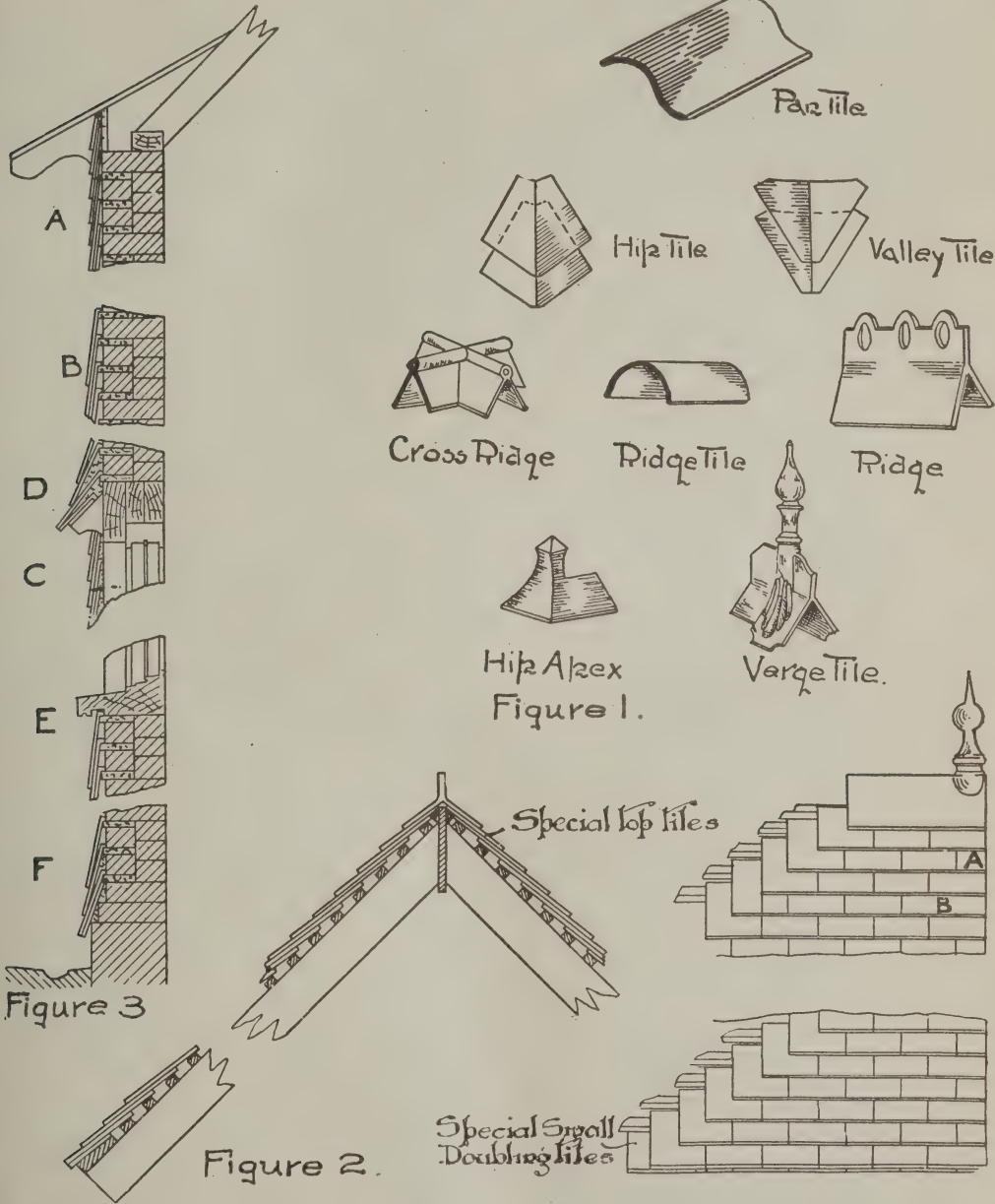
England for many years, I will try and answer builder's inquiry on the subject.

Tiles for roofing purposes consist of thin plates of vitrified clay, and are made in an infinite variety of shapes and sizes.

cause tails to fit closely against course below.

Pantiles are much used for shed roofs, and are curved as shown in Figure 1.

Fixing tiles.—Plain tiles are fixed to



They are usually of a red color, but can be obtained in practically any shade. The tiles in general use are exhibited in the following cuts. Plain tiles are made with a slight curve through their length, to

battens or boards or both, arranged as for slates.

The laths used as for plain tiles are either of pine 1¼ by ¼ inch, and are made in four feet lengths, one bundle of 100



fixed to the rafters with 150 lath nails being required per square of tiling.

The lap used for tiles varies from 3 to 4 inches, according to the size of the tile, the pitch of the roof, and the climate of the locality in which they are used.

The gauge is determined thus:

$$\text{Gauge} = \frac{\text{Length of tile—lap}}{2}$$

In Figure 2,  $10\frac{1}{2} \times 6\frac{1}{2}$  plain tiles are used, and laid with a  $3\frac{1}{2}$ -inch lap, so that the gauge =

$$\frac{10\frac{1}{2} - 3\frac{1}{2}}{2} = 3\frac{1}{2} \text{ inch}$$

When tiles with nibs are used they are only nailed every three or four courses on roofs of steep pitch, while, when on roofs of flat pitch, every tenth course only need be nailed.

Pegs of cast iron or oak are also used for fixing tiles, they being wedged into nail holes and hung upon the laths.

Pantiles are laid upon laths with a good bed of hair mortar to keep them in their place. The laths for pantiles are 10 feet long, a "bundle" of 12, being required per square (100 feet super) of tiling.

Glass tiles of the same shape and size as pantiles are often used for skylights.

The tiling is commenced from the eaves, which are treated in a similar manner to slate eaves, special short tiles being made for the doubling course of the same width as ordinary tiles, and of a length equal to the sum of the lap and the margin, as shown in Figure 2. The doubling course should be firmly nailed to a board splayed so as to cause the tail to fit closely against the tail of the course above. The tail of the lower two courses should overhang the gutter, so that the rain may drip clear of the woodwork. The first batten is fixed at a distance above the lower edge of the board upon which the doubling course is fixed, of the length of a tile less the distance of the nail-holes from the head of the tile, and less the amount of overhang.

When a roof terminates as a verge or against a gable, specially made "half" tiles, as at A, Figure 2, or at "tile-and-a-half" tiles as at B, should be used. The brickwork beneath the verge should be cut to the slope of the roof, and the tiles should be soaked in water and bedded in

Portland cement, and tilted away from the edge, thus throwing the water on to the body of the roof and preventing the verge from dripping.

When the roof abuts against a gable wall the wet is excluded by means of "lead soakers" or "secret gutters."

Specially made short tiles are made for the uppermost courses of tiles, the length being equal to the length of a tile minus the margin plus 1 inch for the nail-hole, as shown in Figure 2.

To obviate the necessity of cutting the tiles at the ridge the following simple calculation is made: The lowermost and uppermost battens having been fixed in position, measure the exact distance from center to center of these and divide by the gauge. Thus suppose the distance from center to center of the two extreme battens is 27 feet  $6\frac{3}{4}$  inches, which divide by the gauge  $3\frac{1}{2}$  inches equal 94 and  $1\frac{3}{4}$  inches over. If the battens are nailed on stating at the bottom, and working upwards are spaced at intervals of  $3\frac{1}{2}$  inches there will be a gap between the two top battens of  $1\frac{3}{4}$  inches, which would necessitate the cutting of an inch off the top tile to keep the margin uniform, but to obviate this, all that need be done is to space the battens a little further apart, a trifle over  $\frac{1}{8}$  inch to each course. It is clear that the gauge is practically unaltered if  $1\frac{3}{4}$  inches is thus spread out between 94 battens.

Specially made tiles are used for covering ridges, as shown in Figure 1, and are usually bedded in hair mortar. It is a good plan to bed only the ends of such ridge pieces, as this permits the air to circulate beneath, and thus prevents the board from rotting.

Purpose made ridge finials are made for covering the apices of verges and the junctions of ridges, as shown in Figure 1.

The vertical joints of ridge pieces should be pointed.

In cheap work the edges of the tiles are roughly cut to fit the hips, and the junction is covered with a half round tile bedded in hair mortar. It is better, however, to use purpose made hip tiles, as shown in Figure 2.

The most usual way of treating valleys is to stop the tiling of the adjoining roof somewhat short of the valley and to form

a lead gutter. Sometimes purpose made narrow tiles are worked round the valley, or purpose made nailing tiles are used, as shown in Figure 2.

The joints of tiles are sometimes pointed as a further safeguard against the passage of wet and wind, and in good work pulverized tiles are often substituted for sand in the pointing mortar, so that its color may be as nearly as possible that of the tiles.

Walls are sometimes covered with vertical tiling for the purpose of throwing off the rain and of maintaining a more equable temperature within the building, the air space beneath the tiles acting as an insulator. If tiles are nailed to the joints of brickwork the gauge is only about 3 inches. This makes the work unnecessarily extravagant in tiles. For this reason they are usually fixed to battens or fixing blocks, or else the wall is built with wide joists, as shown at A, Figure 2 and the tiles are nailed to the joints, the gauge being about four inches, which gives a lap of  $2\frac{1}{2}$  inches.

When battens are used they are fixed to coke breeze concrete blocks to a gauge of  $3\frac{1}{2}$  to 4 inches, but these will decay in time, and should not be used in consequence.

The most satisfactory method of vertical tiling is shown at B, Figure 3, where fixing blocks 9 by 5 by  $1\frac{1}{2}$  inches are built into the wide joints on the face of the wall, the tiles being nailed to the blocks, and if they are ribbed they are hung from the projecting portion of the blocks.

Purpose tiles are used for the internal and external angles of tile hung walls, or else the angles are close cut, with lead soakers inserted beneath the tiles to keep the rain from penetrating.

The tiles at side of openings in tile hung walls should be solidly bedded in cement, as shown at C, Figure 3, and those above an opening should be tilted outwards by fixing the two lower courses to battens attached to tilting pieces fixed to the lintel over the opening, as shown at D, the lower course being a doubling course such as is used for eaves.

The sills of windows are usually formed as shown at E, so that the course of tiles immediately below it can be nailed there-

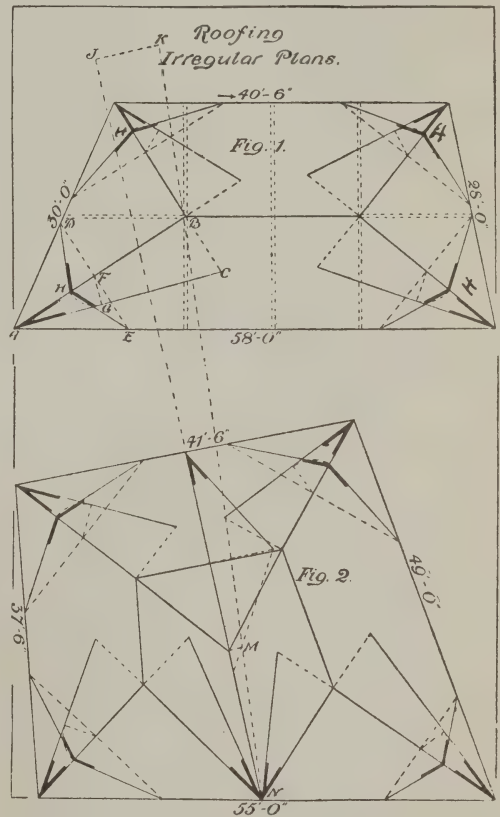
to, thus preventing the rain from driving up underneath.

When the tile hanging is carried down to the ground the lower course is tilted outwards, as shown at Figure 3, a cement or stone channel being formed below to carry off the water which runs off the face of the tiles in very exposed situations.

#### BACKING HIP AND VALLEY RAFTERS

From "Old Chip," Rochester, N. Y.:

This query has been asked and answered numberless times, but like the alphabet,



every beginner must commence at the beginning; for the old fellows, do not always show the young ones how to do such things, and the young chap has to "reach out" for himself when he needs the work on the job. If my young friend "Dawson" will follow me, I will try and show him how he can accomplish what he is after.

Figure 1 shows a roof having various angles, that is, it is not a square building. The hips may always be considered as oc-





To get the side cuts for hip or valley rafters,, take a rule and measure across your framing square from seventeen on the blade to whatever number on the tongue that represents the rise per foot of your roof. That gives you the diagonal, then take diagonal on blade and seventeen on tongue (if you have a square with an eighteen inch tongue, if you have not, then

use half of each number respectively) cut on diagonal.

For side cuts on jack rafters I use the same principle, only using twelve on blade of square instead of seventeen. The difference in length of your jack rafters on two foot centers is twice the diagonal; on sixteen inch centers is one and one-third times the diagonal.

## Questions

### ROUGHCASTING

From "Mudslinger," Duluth, Minn.:

I am in search of information regarding roughcasting, and would be obliged if some one or more of our readers would help me out a little.

### DRY ROT

From "Ignoramus," Flint, Mich.:

Will some kind subscriber inform me what causes dry rot, and how it is prevented.

### BOILER SETTING

From "Brick Setter," Middletown, N. Y.:

Kindly give me a few pointers regarding setting boilers in brick.

### FINISHING THE KITCHEN WALLS

From "C. Q. D.," St. Louis:

Will some competent reader of the BUILDER please give me some information as to finishing the walls of a kitchen. I am as yet undecided as to what would be the best, wall paper or paint. If paint is best, would some one please tell me what kind of mixture could be used with best results, and oblige.

### TILING A BATHROOM FLOOR

From "H. G. N.," Hancock Bridge, N. J.

Will some one please give me information regarding tiling bathroom floors. I wish to give the floor a heavy white coat, then mark in brick work. I want to use soapstone for coloring, which will give me a light blue. How shall I apply the coloring, after I have applied my heavy white coat, with plaster of paris and lime or with just lime.

### ESTIMATING

From "A Young-Un," Buffalo, N. Y.:

Can a fairly correct estimate be made by cubing? Would it be safe to depend on this system? What are the best books on the cubing system? Please name a few of them.

### STAINING WOOD FOR A BUNGALOW

From "Ontario Reader":

Should be pleased to receive information on staining wood for bungalow.

I have interior pine finish, grained, and would like to make it like quarter-cut oak, mission style, dull finish.

Will some reader inform me as to the best method for this work.

### HERRINGBONE BRICK WORK

From "P. W. C.," St. Petersburg, Fla.:

Will some kind reader give me details on the most practical style of herringbone brick work. I have to lay a herringbone press brick floor in the sun parlor of a fancy bungalow and the architect has made no detail.

### PAYMENT OF PERMITS

From J. A. T., Richmond, Ky.:

In the specifications quoted below, will the plumber or the contractor have to pay the city for the permit to tap the sewer or will the owner have to pay it?

Specification: "The plumber is to furnish all piping and make all connections for closets, washer, and down spouts, all of this is to be connected with the Second Street sewer."



# Building Material Price List

Revised to Date

\*Price not given. yp—Yellow pine. wp—White pine. np—Norway pine. op—Oregon pine. rw—Redwood. s—Spruce. oc—Ontario cedar. h—Hemlock. bc—British Columbia cedar. rc—Red cedar. F—Fir. cdr—Common cedar. cyp—Cypress. bm—Board measure. sls—Sized one side. d4s—Dressed four sides. kd—Kiln dried. rg—Rough. c—Clears.

Dimensions—	Seattle, Wash., Corrected by F. T. Bradley	Chicago, Corrected by J. H. Touchstone	Omaha, Neb., Corrected by I. P. Hicks	Southern Ontario, Corrected by F. O. Frantz
	M ft. BM	M ft. BM S2S	M ft. BM S2S	M ft. BM S2S
2x4 in. to 8 in. up to 16 ft., No. 1.....	\$10.00	\$20.00	yp \$27.00	h \$27.00
2x4 in. to 8 in. up to 16 ft., No. 2.....	9.00	17.00		22.00
2x4 in. to 8 in., 18 and 20 ft., No. 1.....	10.00	22.00		30.00
2x10 in. up to 16 ft., No. 1.....	11.00	21.00		24.00
2x12 in. up to 16 ft., No. 1.....	11.00	22.00		25.00
2x14 in. up to 16 ft., No. 1.....	12.50	23.00	*	26.00
Each 2 ft. over 20 ft., add per M.....		1.00	1.00	2.00
Select stock as above, add per M.....	4.00	5.00		
<b>Exterior Finish, Etc.—</b>				
1x3 in. to 1x8 in., No. 1.....	27.00	yp \$30.00	yp \$45.00	wp \$40.00
1x16 in., No. 1.....	39.00	40.00	43.00	40.00
1x12 in., No. 1.....	30.00	35.00	46.00	42.00
1½x3 in. to 1½x12 in., No. 1.....	33.00	45.00	48.00	45.00
1½ in. and 2 in., same as above.....	33.00	45.00	48.00	42.00
1-in. drop siding, No. 1.....	25.00	25.00	30.00	30.00
½-in. lap siding, No. 1 cedar.....	25.00	24.00	rdw 30.00	30.00
<b>Enclosing and Fence Boards—</b>				
1x4 in. to 1x 8 in., No. 1.....	11.00	yp \$24.00	yp \$25.00	wp \$30.00
1x8 in. to 1x12 in., No. 1.....	11.00	26.00	24.00	h 24.00
1x16 in., No. 1.....	15.00	*	24.00	24.00
1x16 in., No. 2.....	13.00	*	22.00	22.00
<b>Interior Finish, Flooring, Ceiling, Etc.—</b>				
1x6 in. T. & G. Flooring, No. 1.....	25.00	yp \$24.00	yp \$38.00	wp \$40.00
1x6 in. T. & G. Flooring, No. 2.....	22.00	20.00	34.00	wp 30.00
Ceiling, per M.....	20.00	21.00	22.00	21.00
Partition, per M.....	30.00	32.00	32.00	32.00
¾x4-in. Ceiling, No. 1.....	22.00	22.00	30.00	np 30.00
4¼-in., Moulded Casing.....	100 ft. run \$2.00	100 ft. run yp \$1.75	100 ft. run yp \$2.00	100 ft. run wp \$2.50
4¼-in. Moulded Casing.....	2.50	2.00	2.50	2.50
7¼-in. Moulded Base.....	3.00	3.00	3.50	5.00
1½x9¼-in. Moulded Base.....	4.00	4.00	4.00	6.00
1½x4½-in. Moulded Window Stool.....	2.50	2.50	3.00	4.00
<b>Miscellaneous List—</b>				
Shingles, No. 1.....	Per M 2.75	rc \$3.50	Per M \$4.00	Per M bc rc 4.00
Shingles, No. 2.....	2.25	3.00		*
Shingles, Fancy.....	3.50		3.75	
Lath, 4 ft., No. 1.....	2.25	3.60	4.50	6.00
Lath, 4 ft., No. 2.....	1.50	2.75	yp 5.50	wp 5.00
Pickets, 1x3 in. x 4 ft. 6 in., dressed.....	30.00	35.00	5.00	s 3.75
Pickets, 1x3 in. x 4 ft. 6 in., rough.....	20.00	*	30.00	*
6 in. x 8 ft. Post, split.....		Piece .17	Piece Cdr \$0.25	Piece *
8 in. x 8 ft. Post, split.....		.66	.30	*
3 in. x 8 ft. Post, whole.....		.25	.40	Cdr \$0.30
6 in. x 8 ft. Post, whole.....			.35	.25
<b>Hardware List—</b>				
Nails, wire, common.....	Cwt. \$2.25		Cwt. \$3.00	Cwt. \$2.85
Nails, cut, common.....	2.10		*	3.00
Nails, wire, fine finishing.....	2.65		3.50	4.00
Sash Weights, cast iron.....	1.60		1.50	2.25
Tarred Felt Paper, best 2-ply.....	Roll \$1.00		Roll \$1.00	Roll \$1.25
Tarred Felt Paper, 3-ply.....			1.25	1.50
Red Rosin, Atlas brand.....			.90	1.00
Red Rosin, durable brand.....			.75	1.00
Black Neponset.....			*	2.00
<b>Masons' Supplies—</b>				
Brick, blue, at kilns.....	Per M *	Per M *	Per M *	
Brick, blue, at kilns, No. 1.....	*	*	*	*
Brick, blue, at kilns, No. 2.....	\$7.50	*	*	*
Brick, white, delivered, face.....	7.00			*
Brick, red, delivered, backing.....	7.00		\$7.50	*
Brick, delivered, dry pressed.....	18.00		18.00	17.00
Brick, vitrified, dry pressed.....	*		24.00	*
Lime, best gray.....	bbl. \$1.30	bbl. \$1.25	bbl. *	*
Lime, best white.....	1.40	1.25	*	*
Cement, Portland.....	.95	1.85	bbl. 1.70	*
Plaster, calcined.....	2.40	1.80	bbl. 2.50	*
Hair, 8 lb. per bush.....	.25	.25	*	*

NOTE—While these figures are approximately correct at the time of preparing, the continual fluctuations and shifting of prices make it necessary to advise our readers to consult local price lists when making up tenders.—Ed.



## LEGAL DECISIONS OF INTEREST TO BUILDERS

*Prepared for the  
NATIONAL BUILDER  
by George H. Murdock*

A provision in a building contract that for each day's delay in completion beyond a day fixed the contractor should be liable in the sum of ten dollars is not a penalty, but is a provision for liquidated damages.—George v. Roberts, 65 So. (Ala.) 345.

An executory contract providing for the construction of a building, not being one of the class necessary to be reduced to writing, may be modified by parol, without any new or independent consideration.—George v. Roberts, 65 So. (Ala.) 345.

A building contractor, voluntarily abandoning a contract, cannot recover for the value of the work and material already performed and furnished.—Lynip v. Alturas School District of Modoc County, 141 P. (Cal.) 835.

The difference between the amount paid the contractor by the owner, under a building contract before breach thereof, and the amount expended in the work by the latter is not a proper item of set-off against the expense of completion by the owner, when the contract binds the contractor to pay the cost of construction in excess of a stipulated sum.—Parr v. Howell, 82 S. E. (W. Va.) 126.

The owner of a building cannot defeat recovery by the architect for services performed, on the ground that the building was not constructed according to specifications, where the owner stood by and acquiesced in a change in the mode of construction.—Johnson v. O'Neill, 148 N. W. (Mich.) 364.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF AUGUST 24, 1912,

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A. E. Taylor, 24 N. Fifth Ave., Chicago.

Charles S. Roberts, 5519 Cornell Ave.

FRED D. PORTER,  
Business Manager.

Sworn to and subscribed before me this 16th day of March, 1915.

[SEAL] CLAUDE P. HOOKER,  
Notary Public.  
(My commission expires January, 1918.)



# With Uncle Sam's Help

PRESIDENTIAL CHANGES frequently bring changes all through the line, right down to the Country Postmaster. It seemed only fair therefore for the new President to select "Squire Randall" to cancel the stamps and represent the Government in return for a life long adherence to the policies of the Party. The Squire had felt for some time that the old homestead was a little shabby, but didn't have the heart to tear it down or mutilate it with up-to-dateness. So the new subdivision on the Hill looked good to him and his family agreed that it was time to build.

## EVERYONE BUILDS SOMETIME

There is a belief that everyone builds sometime and just now it was the Squire's time. How many times he had watched other buildings go up without realizing the many problems between owner and contractor. He had settled a few disputes between contesting parties and the more he thought about it the more he felt the weight of responsibility. He watched out for new ideas and tried to remember them, tried to put down what he wanted, but he was always uncertain just what to do.

## A FIRM OF HUSTLERS

The Squire had seen James Knight and Harold Day grow up from Childhood and could hardly realize that they were now responsible contractors. Their early nicknames "Sunny Jim" and "Happy Day" clung to them although not particularly appropriate. Jim was the talker while Happy was more quiet. The outside work fell to Sunny Jim while Happy took care of the office, drawing the plans, making the estimates and caring for the office and shop generally.

## THE POSTMASTER'S PROBLEM

His official position assured for four years at least, Squire Randall decided to build. He wanted help but didn't know just how to go about it. He knew everyone in the village, and his position gave him a little insight into their business habits. Who sent out bills on the first and who paid theirs on the tenth, who kept up with the

times, read the current magazines and trade papers. He noticed the familiar NATIONAL BUILDER coming to Knight and Day and decided to take a chance on their knowing something about building. A few evenings later found the three in the neat office with catalogs and samples, drawings and blueprints in the delightful confusion of orderliness found only in a contractor's office.

## FEELING THE BOYS OUT

Of course, the boys didn't know just what was in the Squire's mind, so for a few minutes it was give and take, but the Squire soon found the boys were better posted on building than he had thought possible. How could they know all about construction which was carried on in the large cities? How did they know about "Country Estates"? And where did they learn to estimate anyway? It was a puzzle until he saw the rows of well studied catalogs, the samples of new materials, the letters, and the other information from the whole United States. "Yes," said Jim, "when we see anything new in THE NATIONAL BUILDER we send for all the information we can get. Most of it is free, but some costs us just enough to pay the postage. It is all valuable and we save all of it. That's what the bookcases are for." "I see, I see," said the Squire, but didn't see at all, nor did he understand until they had described their struggle for an education and a chance to get a contract. Little by little he saw how out-of-town concerns were really the making of the boys, and how the catalogs, samples and general information were valuable. "Boys," he said, "I thought I would like to build, but this village is hardly up-to-date in some respects. The nearest gas company is ten miles away and the Village Board won't listen to a modern sewer system being put in and taxes are high enough already without building a pumping station. How can we have a house as nice as we ought to have?" That was a good deal for the Squire to say, for he had "boosted" every improvement the village had.

## A WAY OUT

"That is easy," replied Sunny Jim.

"You can have your own gas plant and it won't cost you such a lot either. An acetylene plant can be built along with your house, set in the basement if you wish and you will get gas for less than the city pays. We have just sent to the Alexander V. Milburn Co. of Baltimore, Md., and their catalog V 22 shows just how such a plant is put in and its many advantages." The Squire read what the Milburn Co. had written to the boys regarding their system.

"One of the most attractive and profitable lines for a building contractor to handle in connection with his construction business is the sale and installation of gas plants for isolated houses. There are a great many cases where the client for whom the house is being built does not give the fullest consideration to the matter of modern lighting conveniences in his home. He may have been used to oil lamps only, so that he would not come to a complete realization of the great advantages of a more modern system, unless it were brought to his attention by some outside person. Again, he might be laboring under the impression that such modern installations are necessarily always expensive. The building contractor is in an excellent position to explain the advantages of the approved systems and the wisdom of investment in them and thus secure an additional item in the construction of the building, on which he would also make a nice profit.

"Milburn Gas Plants for country homes present an unusually active line in lighting plants, on account of their being built in all sizes, suitable for any house from the small bungalow up to the large public institutions. The smaller sizes of machines, ranging from 16 lights to 48 lights capacity are known as the 'Homegas' type, and the larger machines, from 50 lights upwards, as the Milburn Wheel Feed Machines. All of these machines are extremely simple and easy to understand and operate. They are entirely automatic in their generation of acetylene gas and the gas is piped from them throughout the house in the same manner as city gas.

Acetylene furnishes the finest white light known today. It adds great comfort to the evenings at home, saves eye strain and enhances the value of property, both through its additional convenience and the

attractiveness that is imparted to the house. Cooking can also be done with acetylene gas just the same as with city gas. This is a great labor saver both winter and summer, especially appreciated on the hot summer days."

"Now," said Harold, who had let his partner do most of the talking. "That is the kind of a plant to put in. We can do the work for you just as well as the carpentry, in fact we will hand the house over to you complete."

#### THE TALK TURNS TO PLUMBING

"What do you do about plumbing?" asked the postmaster, "I didn't know you were plumbers too." "Yes, we look after that as well. We can buy as cheaply as anyone. We have the catalogs of B. Y. Karol, 800-02 So. Kedzie Ave., Charles P. Kulp and Company, 1611 S. State St., and The John Hardin Co., 47th and Cottage Grove Ave., all of Chicago. Mr. Karol has just built a three-story show room and factory and has a mighty nice place. We saw it a few days ago and congratulated Mr. Karol on its fine appearance.

"Mr. Kulp has just called our attention to the simplicity of the installation of their outfits. At first we imagined it would need a journeyman plumber, but the fixturers are made so that practically all of the old-fashioned lead work is done away with and any man of ordinary mechanical ability can set up the plumbing system complete.

"We have had considerable business with the John Hardin Company also," said John, "for they have been established thirty-five years on the same corner. We know they can supply everything to make a country home as comfortable as a city one, that is, in Plumbing, Heating and Lighting Plants, as well as Air Pressure Water Systems. This makes it possible to move right out into the woods, so to speak, and you only need to put in a telephone and you are as handy as on the boulevard. The Hardin Co. figure the whole project out for us and their plans are so easy to follow that we never make a mistake."

"That's mighty interesting," said the Squire, "but what a lot of time it took to study that all out." "Oh, yes," the boys said, "but it was interesting, and right in



our line and it came easy. Sometimes we nearly got caught, but we always managed to dig up the information in time. Catalogs are great things, and that file in front of you, Squire, is only a fraction of what we have ready to turn to. We always look every catalog through and know just what is in it before we file it in its proper place."

#### THE SEWERAGE SYSTEM

"But they haven't any sewers in yet, have they?" asked the visitor. "No," the head of the firm replied, "they promise to soon, but that shouldn't worry you. Put in your own. There are a number of ways, and possibly a Septic Tank provides the best all around method. But that costs money, you think. Not a whole lot more than connecting to a sewer, and paying taxes and assessments. Being on your own land and under your control, you can make it as elaborate or simple as you like. We can put that system in too, although you could do it yourself. Scientists like Theodore Aten, in the Wells Bldg., 5th Ave. at 30th St., New York, have made a deeper study of Sewage Disposal than we have and he will make us a plan for the necessary tanks, piping, etc. We have only to send him the plans and give him the necessary information and we get posted on the subject."

"Another good system is by means of 'Chemical Closets.' These closets are similar to closets in the city, except that no water is used. A chemical is used instead and the system is simplicity itself. The Dail Steel Products Co., 835 Main St., Lansing, Mich., have a system which can readily be used in schools, public buildings, as well as in private buildings, etc., as the adaptability is practically unlimited. The chemical used is many times stronger than carbolic acid, yet is safe to handle, and the system has the approval of Boards of Health and similar organizations everywhere. If the use of these closets were more general there would be less typhoid and similar diseases."

"We have had good success with the Ro-San Chemical Closet too. This is made by the Rowe Sanitary Manufacturing Company, 203-A 6th St., Detroit, Michigan. We find it cheaper to install one of these closets than to build the out-door kind and

you needn't be told that it is a hundred times better. The closets are as sanitary as the most expensive city layouts that cost a hundred dollars or more and don't need much more attention. Five cents a week will pay for the chemicals used, so it is not an expensive outfit to maintain. The water tax in the city is alone more than that. We always bring one of these closets on the job for our own men and when the building is finished install it in place of an outdoor vault."

"Didn't I hear that Harry Baldwin had one of those closets in his farmhouse?" said the Squire. "Yes, that one was made by the Kaustine Company, Dept. 1094, Buffalo, New York. We fixed up a nice little toilet room off the kitchen, taking the space off the woodshed. Harry says he doesn't know how they got along without that room before, and he has helped us get several similar jobs out his way. You see, we depend on one job to help us get half a dozen more, and that is why we get along so well."

#### HOW ABOUT THE COLD DAYS?

"Does the wind blow up on the hill in Winter, I wonder," said the Squire, although it was a nice spring evening outside. "Sometimes it does," said Harold, "I live there myself you know, but I put in a good furnace, and we don't have a bit of trouble. You know, anyone can do a job right if he is shown how, but there was no one around here to show us so we just investigated for ourselves. When we got through we were able to tell how everything should be done, from the coal chute to the ash pit. Now here," and another pile of catalogs came out of the bookcase, "is how we do it. A great many of the responsible concerns not only guarantee the furnace, but they will make a plan of the entire outfit, showing just where everything goes and how it fits with the rest of the work. We send them a plan of the house of course and they lay everything out for us. We could do it ourselves, but we like to get their ideas as well as ours. A furnace is not like other furniture, it does a lot of work in the winter, and burns a lot of coal, and it must be designed to get all the heat out of the coal and not send it up the chimney. Some people imagine all they have to do is 'shovel in the coal' to get heat in the rooms, but there is a

scientific way to get the best results. In every heating plant we put in, we spend a little time instructing some one just how to fire and tend it. It pays us to do this. We know one house where it took twenty tons of coal one winter and then the house wasn't warm. The next year, after proper instruction, six tons did the work better than the twenty.

"There is a difference in furnaces, too, but not so much as that," continued Jim. "We have put in a number of styles and all seem to do well when properly taken care of."

"We were surprised when we found that the Hess Warming and Ventilating Company, 1907 Tacoma Building, Chicago, did not sell through dealers. They believed that the hardware dealer had too much to do looking after nails, screens, hardware tools, etc., to be an expert on heating. So they have been making plans for us right along and the plans are so complete, showing every pipe, register, etc., that we have had no difficulty fitting everything. Then too, we don't have to go to any intermediary, we deal right with the manufacturer. Everything is included in their shipments and goes together nicely. They would even loan us a set of tools to use in putting up the plant, but we have everything ourselves now for that work."

"Some furnace companies make every effort to please," said Harold, "The Holland Furnace Co., Holland, Mich., get their customers enthused over their furnaces. Their slogan 'Holland Furnaces Make Warm Friends' is a good one and is backed up by a big organization which will do everything right and on time. They have over a hundred branch houses, so everyone is assured there will be no delay in shipment. Of course, they have their furnaces on display there, too, and we sometimes take people to the city to see them. It gets away from visiting some one who has had one of their furnaces put in, and we can take the whole furnace apart for them, so to speak."

"One can get a pretty good idea of a furnace from the catalog of the Gibson Mfg. Co., 415 Miles St., Waterloo, Iowa," said Jim, picking up a beautiful booklet. "They show just how the fire travels from the extra heavy firepot, through the combustion

chamber, down and through the 'radiator' before going into the chimney flue. They claim, and it looks reasonable, that this makes their furnace economical in operation, giving the largest amount of heat for the fuel consumed. You see too, the sides of the firepot are nearly vertical so the fire does not clog. The easier a furnace is to take care of, the better results you get, for everyone is not a skilled fireman."

"Well," said the Squire as the boys handed him the catalog of the Ajax Furnace, "I think Ajax defied the lightning, didn't he? And here he is defying the cold too." He laughed at his own joke, but found serious reading in the catalog of the Co-operative Foundry Co. "I see they come from Rochester, N. Y., and they give their post office box 1029. Well, as a postmaster, I must say that means they will get their mail promptly for every postmaster likes to see the complete address given. If they pay as much attention to all their business as to that point they will get along all right. A 'Low Down Furnace,' that's just the thing for old buildings, isn't it? So many houses built with low cellars, as though the cellar wasn't good for much. I see they make furnaces for soft coal as well as for hard coal. That shows too that they are anxious to send just the furnace to suit the case."

"And here is one for natural gas as well as coal," he continued, taking up the catalog of the Gem Furnace, made by the Robinson Furnace Co., 205-7 W. Lake St., Chicago. "That is something which might come very handy if they strike gas near by and anyhow it shows that they are prepared for any thing that comes. Haven't any heated with electricity, have you?" he asked jokingly, as he read about the High Ash Pit, the Sectional Firepot, the Corrugated Dome and the Cast Iron Radiator of the Gem Furnace. These things all seem to me to be very practical, and in the interest of the consumer. I'm getting along where I want to keep warm, and I'm going to look over these catalogs pretty carefully. I was brought up on a farm where we always had plenty of wood, and several fireplaces, where we roasted our faces and froze our backs, and I can appreciate a nice even heat."

"Well, you can get that in fireplaces too," said Jim, pulling out a Fireplace



Damper, made by the Stover Mfg. Co., 35 East Street, Freeport, Ill. "This damper is designed to save fuel, eliminate smoke and throw the heat out into the room. We use these when we build fireplaces and we can easily build them into old fireplaces too."

"But what would you think of warming several rooms with one fireplace?" said Harold, turning the pages of the catalog of the Heitland Grate and Mantel Co., 125 No. Fifth St., Quincy, Ill. "Here is a clever arrangement by which the heat usually wasted in a fireplace is used to heat water pipes which carry the heat to several rooms, either on the same floor or to upper floors. The fireplace looks just like any other fireplace and we can fit it with any mantel you want. It's just the thing for a small house or bungalow. You get beauty and utility, both in one. You can see the last one we just put in Mrs. Peterson's bungalow. The fireplace is in the parlor but the heat is piped to the Dining Room, and to two rooms in the 'attic.' The runs are rather long, but we have found there is little loss of heat when the pipes are covered with Pipe Covering. The Johns-Manville Company make almost everything in Asbestos, so we bought some Asbestos pipe covering for the job and it does the work."

"How are you going to get the coal into the cellar?" asked the Squire. "I have just paid for a broken cellar sash and think there ought to be a better way."

"There is," said Harold, "See how this one works" and he turned to the partition between the office and the shop, "This is a 'Roenius' made by the Grand Rapids Foundry Co., Grand Rapids, Wis. It is a sample and we use it to send orders to the shop." The Squire saw a neat metal panel drop down and form a perfect coal chute, metal throughout, with nothing to break or be damaged. "This Coal Chute will take the Fuel right into the bin, and is easily locked, you notice, too, the glass in the door when the chute is closed."

"And here is another style, made by the Kewanee Mfg. Co. of Kewanee, Ill. From the frame clear through it is steel, and there is nothing to get out of order. There is no danger from thieves for it is automatically locked from the inside. This opens, as you see, from the shop, and shows you the cellar side."

"Well, you boys certainly know what you are doing. I want to think all this over and see what it will cost."

"That is just where Day shines," said Jim. "He doesn't say very much, but he is up on costs. He has to be, for he does all our estimating. We have your ideas now as to what you want and we will get you up a little plan at a price that will please you. See if we don't."

The Squire gathered up his catalogs and booklets. "Let me know when it is ready and how soon you can start," he said as he left them.

## Dick and Pete—Also the Paint Man

*F. Ford*

DICK AND PETE are both contractors in Blankville. Though competitors in business, they are good friends and on the best of terms with each other. Yesterday they happened to meet in the Citizen's Bank.

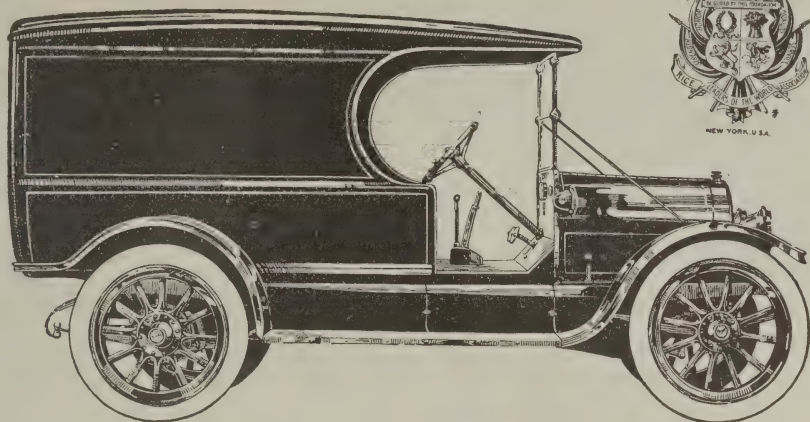
"Hello, Pete," cried Dick, "what's wrong? You look as if you were attending your own funeral."

"Wrong?" said Pete, "everything is wrong. I lost the contract to build Jim Barker's new bungalow through that fool painter, Robinson."

"What!" inquired Dick, "drunk again?"

"No, not drunk this time. But Jim Barker asked me to give him my figures on the house all finished and ready to move into, including painting, window shades and everything. Well, I couldn't figure on the painting, so I went to Robinson and he promised me have to have his figures on the job over a week ago. But I didn't get them till this morning, and when I went up to see Barker he told me he got tired of waiting and had already given the contract to another man, though he didn't tell me who it was."

"Well," said Dick quietly, "I'm the

**\$850**

*With open body  
Equipped with Electric Starting  
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**Overland**  
TRADE MARK REG.  
**DELIVERY  
CARS**

*Prices f. o. b. Toledo*

**\$895**

*With closed body  
Equipped with Electric Starting  
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## This Car Saves Time And Trouble For Builders

**O**NE of your biggest problems lies in getting yourself, your men, tools and supplies from job to job quickly. You require a means of transportation which is speedy and absolutely dependable—yet one which is economical.

Many builders are finding the Overland Delivery Car a valuable asset in this respect. It does work far more quickly and dependably than a horse or a team—and at a very moderate expense.

It will enable you to supervise all of your work in person. It reaches

widely separated points in remarkably short time.

The Overland Delivery Car has an electric starting and lighting system. You will appreciate this advantage. Its left drive and center gear shift make driving easy. The sturdy 30 horsepower motor has a surplus of power over anything you will ever require.

This car costs less than \$900. The Overland dealer in your city will be glad to show you what it can do. See him or write to us for a delivery car booklet. Please address Dept. 256.

**"Made in U. S. A."**

**The Willys-Overland Company, Toledo, Ohio**

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TISERS. IT HELPS.



lucky fellow and I have the contract in my pocket right now, though I am mighty sorry you failed to land it, Pete."

As Dick made this announcement Pete looked on the verge of a stroke of apoplexy. He burst out furiously, "I've a good mind to thrash Robinson. He double crossed me. Told me he would give me an estimate of the painting of that house and then went and gave it to you and left me in the lurch."

"Hold on, Pete," said Dick, "I've never seen Robinson. He has had nothing to do with this contract. *I figured the painting myself.*"

"How the dickens did you do that? You're no painter," said Pete.

"No, but look here," answered Dick, and he took out a neat, little book from his vest pocket. "See this; it enables one to estimate the cost of painting any house in a

few minutes and so when Jim Barker wanted a complete estimate of the finished house, and wanted it in a hurry, it was a very simple matter for me to figure it out with this ready reckoner of paint. That's how I landed the contract."

"Well, I'll be blowed," said Pete. "How much do one of those books cost?"

"Cost nothing!" answered Dick. "Don't you ever read your NATIONAL BUILDER? You'll find that and a whole lot of other good things there, to be had for the asking."

"Guess I'll have to look it over," said Pete, scratching his head. "Darn it, I haven't looked at one of those papers for three months. I have been so blamed busy that I just can't find time. Beats all, Dick, how you keep up with things. How do you find time anyhow?"

"Pete, old man, I don't find time, I take it," answered Dick.

## Trade Review

### Ventilation

Plenty of pure air is the first requirement to health. Ventilation cannot be obtained without observing the scientific principles underlying the subject. These principles have been well worked out by a number of manufacturers of ventilators and ventilating equipment, among others, the Royal Ventilator Co., 410 Locust St., Philadelphia, Pa.

A number of states have passed laws to compel the ventilation of public buildings such as theaters, schools, hospitals, etc., but it has been somewhat more difficult to convince private owners of the value of adequate ventilation. The fact is becoming generally known, however, that much greater efficiency can be obtained through the use of properly designed ventilators. On the farm the barns must be properly ventilated, supplying the animals with plenty of fresh air, and for this purpose the Royal Ventilator is especially adapted, as it is impossible to set up in any but the correct way and the ventilator is so designed that there is always a current of air flowing through it in the proper direction.

The Royal Ventilator is made in a great variety of styles and sizes, some of them

being provided with glass tops, thus giving light as well as ventilation where required. The circular of the Royal Ventilator Co. shows the various exclusive features of the Royal Ventilator such as the double cone tapered reflector and their storm proof construction. The catalog will be sent to our readers on request and will give them much valuable information.

### The Sultan Portable Woodworker

Six carpenters would be kept mighty busy doing the same work which a Sultan Portable Woodworker will do. Incidentally the carpenters would be paid about \$20 a day more than the gasoline would cost. Moreover the Sultan will do work in the shape of jointing, rabbeting, tenoning, etc., which would be impractical for men to attempt on the job. The Whitman Agricultural Co., 7005 South Broadway, St. Louis, Mo., have a catalog showing the Sultan Woodworker and indicating its value to the contractor. This catalog will be sent to our readers on request and it will show them how one man can do the work of half a dozen.

# 15 Salesmen Working For Me and More Coming



These salesmen are my customers—property owners—whose residences I have covered with NEPONSET Shingles. They are the biggest boosters of the shingle I know. They're turning business my way every week. There is no roof so attractive as that covered with

## NEPONSET Shingles

PATENTED

Each shingle is specially built up—the butt end being three times thicker than the top end! When laid they form seven layers. That will give you some idea of their durability. Why not get a sample and investigate for *yourself*?

The same materials are used in **Neponset** Shingles as in the well known **PAROID** Roofing, also used in **Neponset** Proslate, the highest grade colored ready roofing ever made. **Neponset** Wall Board, **Neponset** Waterproof Building Paper and **Neponset** Floor Covering are other well known **Neponset** products.

**Bird & Son, Dept. N, East Walpole, Mass.**

Please send me a sample of the NEPONSET Shingle. This does not obligate me in any way whatever. Also send copy of your booklet "Repairing and Building."



Name \_\_\_\_\_

Address \_\_\_\_\_

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WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



### Modern Refrigerators

During the winter months a refrigerator is not quite as necessary as in the summer and during the summer the furnace does not require as much attention as on the cooler days. We would not think of trying to keep house without some heating facilities nor should we attempt to get along without suitable means for protecting our food from dust and dirt, as well as from the summer's heat. The McCray Refrigerator Co., 748 Lake St., Kendallville, Ind., are well known as specialists in the manufacture of refrigerators for all purposes. For the convenience of our readers they have prepared a number of booklets showing the various styles of refrigerators, as well as their installation in residences, hotels, clubs and institutions, meat markets, and groceries. The booklets on these various subjects show the floor plan, indicating the general arrangement of the refrigerators, the complete refrigerator itself, as well as photographs of the completed buildings in which the refrigerators are installed. A great deal of valuable information is given as well as sizes, prices, etc. Our readers can obtain the catalog or catalogs which deal with the classes of buildings in which they are most directly concerned.

### The Porter Junior Bench Jointer

The contractor and builder has frequent use for a jointer such as the Porter Junior Bench Jointer. This machine is small in size, yet it is well adapted to the general work required by the builder or contractor. The jointer is made in a number of styles and sizes so that the contractor has considerable latitude for his selection.

This jointer is only one of the several machines made by the C. O. Porter Machinery Co., 606-8 Front Ave. N. W., Grand Rapids, Mich. Among the other machines which we notice in the general catalog are wood shapers, in several styles, swing cutoff saws, wood turning lathes, etc. The C. O. Porter Machinery Co. make a specialty of accident preventing appliances to be used on their own as well as on other machines. The use of these appliances do not reduce in any way the output of the machines; on the contrary the freedom from accidents by

their use enables the workmen to turn out a much larger amount of work in the same time. Those of our readers who are interested in wood working machinery as well as in modern safeguards for them should have the Porter General catalog.

### Unit Sash Balances

Catalog No. 22 of the Pullman Mfg. Co., 12 Industrial St., Rochester, N. Y., contains a complete description of the Pullman Unit Sash Balance and also gives complete data regarding the various styles, sizes, weights, prices, etc. The contractor will have no difficulty in figuring the size balances required and he will then realize the advantage of using them, both in new buildings contemplated or under construction, and in old buildings where repairs are being made.

The Unit Sash Balance takes the place of the old-fashioned window catch as well as the later form of double hung sash. The use of the balance of course obviates the necessity of using sash weights, cord, etc., and frequently means a considerable saving on the cost of the job as well as the weight which comes upon the building through the heavy iron sash weights.

The Unit Sash Balance is particularly desirable for use in places where the ordinary pulley cannot be used. This is especially noticeable in narrow mullions as well as in some of the older buildings which were erected before double hung windows came into general use.

### A Metal Lath Hand Book

The Associated Metal Lath Mfgs., 812 Wick Bldg., Youngstown, Ohio, has just issued a most complete book on the use of Metal Lath, showing in detail the wide variety of purchases for which it is readily adapted and also showing the results of a great variety of fire and water tests. The book contains also directions and specifications for stucco work, overcoating, preparation of mortar, metal furring, and much other valuable information. It shows in an impartial way the various makes of Metal Lath, together with their sizes, weights and other details.



Figure 1. Portion of Cornell Plant Showing Part of Dam.

### Where Cornell Board is Made

Let us imagine ourselves in one of the beautiful valleys of a small stream in Wisconsin. Pine, spruce, hemlock and other woods are all around us. In a little clear-

forced concrete construction throughout has been designed and built expressly for making Cornell Wood Board.

The Cornell Wood Products Co., besides this plant have their own timber land from which they cut the spruce necessary to make about 450,000 square feet of Cornell Board every day. This means considerably over ten acres of surface, or enough to finish the interiors of two hundred five-room houses. In other words, one day's



Figure 2. Some of the Grinders.

ing between the hills an immense concrete dam has been erected, giving a head of something like 45 feet and furnishing a minimum of 20,000 horse power. Built



Figure 4. One End of Paper Machine.

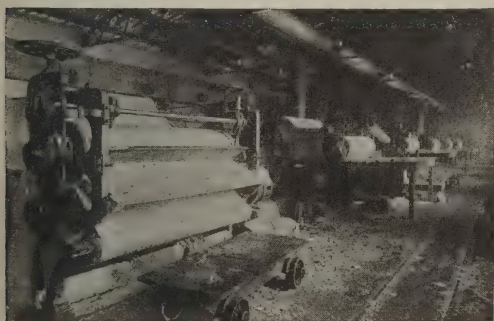


Figure 3. Winding the Pulp on Rolls.

right in connection with the dam is a manufacturing plant covering thirty acres of concrete floor space. This plant of rein-

products would cover the walls and ceilings for all the houses in a town of one thousand inhabitants. That this capacity is justified will be realized from the fact that the Cornell Wood Products Co. has been compelled to build several extensions to their plant since the original buildings were erected.

The photographs with this article show in general the process of manufacture and give one an idea of the extensive scale of



operation. The plant is operated continuously without regard to the weather. The photographs herewith having been taken when the thermometer was 20 degrees below zero.

The logs from which Cornell Wood Board is manufactured are brought to the

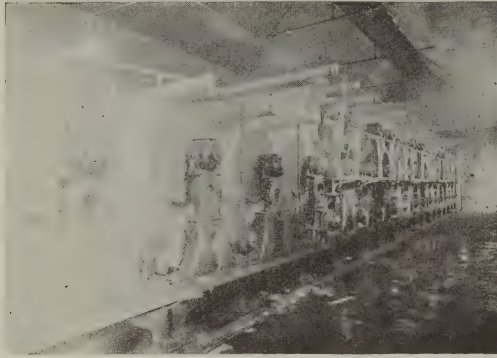


Figure 5. Another View of the Paper Machine.

plant, cut into suitable lengths, and are brought to the grinders shown in Figure 2. These machines quickly reduce the logs to a pulp which is made into sheets on the machines shown in Figures 3, 4 and 5. A number of these sheets are then combined to form the proper thickness for the board and are then finished, cut and made into packages for shipment.

The Cornell Wood Products Co. believe that controlling the entire operation from

the forest to the consumer they are in better shape to assure the customer of the highest quality throughout. In the process of manufacturing the wood fibres are thoroughly sized, not only on the exterior but entirely through the material, thus insuring Cornell Wood Board against warping or swelling. Not only can the Cornell Company assure their customers they can make prompt shipments, but they have reduced the price through the enormous quantities which they manufacture.

The Cornell Wood Products Co. have in their office at Cornell, Wis., some mighty



Figure 6. The Crane Used for Unloading Logs.

interesting literature on the use of Cornell Wood Board, which they will be glad to send to our readers on request. It will post them on this material and aid them in securing contracts on this class of work.

### Fireproof Paint

The great danger from any fire is directly at the start. If a fire can be kept down at the beginning there is little danger of its spreading to a conflagration. There are many places where combustible materials are used, such as the ceilings in mill buildings, partitions, doors and similar places where a small amount of fireproofing will be of great value.

To provide for work of this character the Johns-Manville Co. New York, have prepared their "J-M" asbestos fireproof paint. This is composed mostly of asbestos together with coloring matter to give practically any desired shade. The nature of the material is such that it will not chalk, scale or peel off but forms a hard, firm and sanitary coating

This paint is so prepared that it can be used with either a brush or a painting machine, so its use where large surfaces are concerned is made possible at very slight expense.

The Johns-Manville Co. have prepared a special circular on this paint, which comes as a dry powder in packages of five to three hundred fifty pounds and needs only to be mixed with cold water to be ready for use. This circular contains a color card showing the actual material in the numerous colors in which it is made and indicating the appearance of the finished work. This circular will be sent on request and as it gives prices covering capacity and directions for use, etc., it will prove extremely interesting.

# Estimates FREE!

## Lower Than Others! GUARANTEED Right!

### Jap-A-Top Roofing

Beautiful — Durable. Surfaced with genuine Slate, 2 colors—Red and Grayish Green.

Per roll of 100 Square Feet—**\$2.25.**

Jap-A-Top Diamond Point Roofing—in rolls but goes on to look like Shingles—per roll of 100 sq. ft.—**\$3.00.**



Price per sq. of Jap-A-Top Shingles, 424 Shingles—**\$4.75.**

Also Other Quality Roofing



### Windows

We have plain and fancy windows in all standard sizes and at all prices. Check Rail Windows 70c up. Plain rail, glazed, 76c up. Transoms, 38c each. 8x10 window glass, 3½ cents per light. See pages 44 to 46 of Catalog.



### Wallboard

Wallboard is the Great Modern Substitute for Lath and Plaster. Quality Wallboard 1000 Square Feet—**\$22.** See Special Offer in Catalog, pages 108 to 111.



**LET** our Contractors' Service Bureau give you a "Guaranteed Right Estimate" on your bill of materials. A complete house or any part of a house at wholesale prices. Our "mill-direct-to-builder" plan of selling saves you dollars on the bill for every nickle in freight. No time wasted. Prompt deliveries Guaranteed. More than

**14,000 Contractors, Carpenters, Builders Buy Regularly at Our Wholesale Prices**

Do the same! All stock fresh and clean. Three strong banks and 100,000 home builders speak for our reliability. We ship 90% of orders same day received. Hundreds of items ready to ship from our stock that local yards usually take weeks to have made to special order.

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Let our Contractors' Department estimate, plan, solve your knotty problems and increase your profits. It can. Put this unique free service to work for yourself. Write your requirements and get our figures.

**Use This Coupon!**

Get this Great 5000 Bargain Catalog Free! Everything the builders need is in it.

### LUMBER IN CAR LOTS SAVE \$100 to \$300



Send for our Special Latest Lumber List. Millions of feet of clear, dry, clean, seasoned lumber at Wholesale Prices. Everything in Lumber. All your wants supplied at a moment's notice. Dimension, Heavy Joists and Timber, Drop Siding, Bevel Siding, Ceiling, Flooring, Partition, Wainscoting, Finishing Lumber, Lath, Shingles, Boards, Posts, Poles, and Battens—all grades in accordance with rules of the Lumbermen's Association. See Special Lumber Price List in Catalog—pages 81 to 83.

### Front Doors

We make all styles and sizes of doors—for both outside and inside use—quality guaranteed from \$1.07 up. Hundreds of special designs ready for immediate shipment. Glazed or unglazed. We carry the largest door stock in America ready for prompt delivery. See pages 9 to 32 in Catalog.



### Stair and Other Millwork

You can buy material for a complete flight of stairs for \$23.93. We carry in stock, designs which admit of many variations and offer an infinite variety of arrangements. Prompt delivery—no delays. We will be glad to quote you on stair work of any special dimensions.



### BUILDING MATERIAL CATALOG



**FREE!→5000 Bargain Catalog**

GORDON-VAN TINE CO.,  
764 Federal St., Davenport, Iowa

Gentlemen:—Please send the books checked below.

☐ Building Material { Lumber, Millwork, Hardware, Paint, etc.

☐ Plan Book

Name.....  
Address.....  
Occupation.....

**Gordon-Van Tine Company**

*In Business Half a Century*

**764 Federal Street, Davenport, Iowa**

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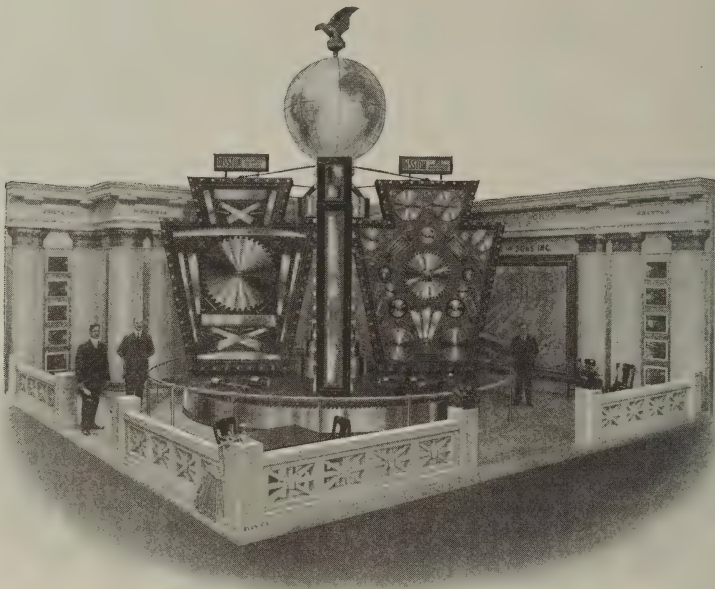


### The Disston Exhibit at the Panama Exposition

The exhibit of Henry Disston & Sons, Philadelphia, Pa., at the Panama-Pacific International Exposition at San Francisco has been planned on a most elaborate scale. The display occupies a prominent position

and should be most attractive as exemplifying what has been done in this length of time.

No attempt has been made to show the complete Disston line but rather some of the



The Disston Booth at the Panama Exposition.

in the central aisle of the Palace of Manufactures

The exposition to a certain extent also celebrates the seventy-fifth anniversary of the establishment of Henry Disston & Sons. It is plain, therefore, that the Disston ex-

hibit should be most attractive as exemplifying what has been done in this length of time. Those of our readers who are fortunate enough to attend the exhibition will be interested in this section.

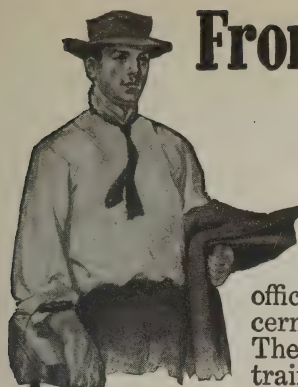
### Wood Mosaic Floors

Did you ever stop to look in a show window gotten up regardless of expense to attract customers? If you did you probably noticed that the floor was a pleasing pattern of wood mosaic or parquetry. Perhaps you have seen the workmen putting it down or perhaps you did not see it until the painter had given it a beautiful finish. At any rate the finished floor is attractive and is a most excellent way of setting off the finest goods which can be displayed upon it.

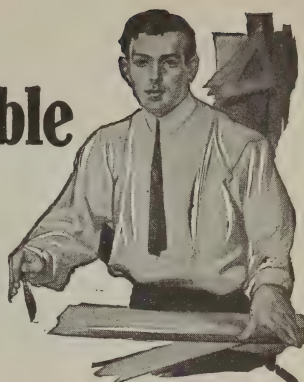
Doubtless you have wondered, too, why this same floor would not make an excellent appearance in an ordinary residence.

It would, and the only reason it has not been more generously used is the thought that it was too expensive and too hard to keep in order. The use of other hard wood floors however, is teaching that they are not hard to keep in first class condition while comparative costs show that Wood Mosaic or Parquetry are little if any more expensive than the old fashioned carpets or the ordinary hard wood floor.

The Wood Mosaic Co., 33 Hebard St., Rochester, N. Y., in their latest catalog give a short history of Parquetry flooring, the woods used, and an idea of some of the many beautiful patterns which can be



# From Dinner Pail to Drafting Table



One year ago a young man in an Iowa town was working as a machinist's helper at \$1.75 a day. Now he is a Draftsman in the offices of a large manufacturing concern at a salary of \$1200.00 a year. The American School of Correspondence trained him for this position.

Here is your opportunity to get the training you need to hold down a similar job and earn big money—\$100.00 to \$250.00 per month paid to expert draftsmen. Our easy, practical method will teach you ARCHITECTURAL DRAFTING, STRUCTURAL DRAFTING or MECHANICAL DRAFTING in a few months. You will receive expert individual instruction in the course you select. All drafting instruments and materials supplied absolutely at cost. Also big four volume Cyclopedia of Drawing sent free if you enroll now. Drafting is the foundation of all engineering professions. Prepare yourself for a real man's work. This special offer is made by the greatest non-resident educational institution in the world—a school whose guarantee is backed by seventeen years of successful teaching by correspondence. Just sign and mail the coupon.

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The complete Draftsman's Outfit, exactly as illustrated, consists of imported German silver drawing instruments in morocco case; 20x25 inch drawing board; ebony lined mahogany T-square; transparent triangles; German silver protractor; French curve; triangular boxwood scale; waterproof ink; pencil; erasers; shield; pencil pointer; handmade drawing paper and thumbtacks. Instruments made by largest and most reliable manufacturer and guaranteed accurate. This complete outfit, offered by many dealers at from \$15 to \$18, will be furnished to you at \$6.40 per set.

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easily made. The catalog is beautifully illustrated with numerous interior views showing Parquetry floors in actual use as well as exteriors of many buildings.

The Wood Mosaic Co. will be glad to send their booklet "Wood Mosaic Floors" as well as their general catalog to those of our readers who are in a position to make use of it. Our readers can therefore learn how to increase their custom in both old and new buildings.

### The Talking Level

It doesn't take very much "out-of-level" to lead to serious consequences. Therefore, the almost human indicator on the levels made by the Toledo Indicating Level Co., 2041 Nicholas Bldg., Toledo, Ohio, is a real time and error saver. The old-fashioned level, in the hands of a skilled mechanic would give satisfactory results, but the Toledo Indicating Level in the hands of the youngest apprentice will indicate not only how much the work is out but will indicate the error in degrees also, if required.

The Toledo Indicating Level is especially desirable for laying out cement work, roofs, and other work where there is a given pitch. It is the only level made which can be used in this way without adjustment and can be as readily used to lay out a pitch of three inches to the foot as to determine an absolutely level line.

The Toledo Indicating Level Co. have a most remarkable free examination offer in which the contractor or mechanic is privileged to test the level in any desired manner for several days, before being expected to pay for it. The full particulars of this offer can be obtained from the manufacturers at the above address.

### The Universal Hoist

The contractor must have adequate hoisting machinery and it must be such as the men have perfect confidence in. Unless they feel perfectly safe in working around it there will be considerable delay in getting loads on and off besides the risk of accidents.

The Hoisting Apparatus made by the Universal Hoist & Mfg. Co., 615 State St., Cedar Falls, Iowa, possesses features not generally found on other hoists. Among

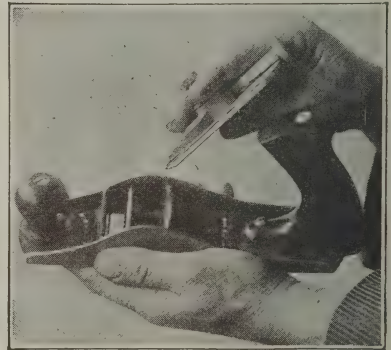
one of these there is an automatic trip arrangement which stops the car or cage exactly even with floor every time. When one considers the usual method of hoisting, by tying a string or marking with paint on the cable the accuracy of this automatic method will be appreciated.

Other valuable features in the hoist consist of the brakes which will hold the car firmly in the desired position.

The Universal Hoist is made in several styles and sizes and with a variety of equipment to suit the purchaser. The hoist is fully described in the circulars which the Universal Hoist & Machinery Co. will send on request.

### Buckeye Iron Planes

With the intention of simplifying the carpenter's work and making a plane which could be more easily set and adjusted the Buckeye Saw Vise Co., 2044 North 55th St., Cleveland, Ohio, have prepared the new improved Buckeye Iron Planes. The cut shows in a general way the simplicity of the plane and indicates the combination of blade, cap plate and tension screw which, being all in one piece, are more easily re-



The Buckeye Plane.

placed, tightened and set ready to cut any desired thickness of shaving. The manufacturers claim for this plane that it will clean up veneer work as well as any veneer scraper on the market as well as do considerable other work not usually performed by planes.

The circular which the Buckeye Saw Vise Co. will send to our readers on request describes this plane in detail and shows its operation, adjustment, etc.



# "Globe" Ventilators

—now made with Weather Vanes

The only way we could improve "Globe" Ventilators was by adding Weather Vanes; so we added them.



The basic principles of efficiency and durability, that our 35 years' experience have proven *correct*, could *not* be bettered.

The "Globe" created and maintains the highest possible standard of quality in ventilator design and construction.

The "Globe" is constructed of heavy galvanized iron and is positively storm proof. It will remove all super-heated and impure air, odors and moisture from barns, stables, creameries and other farm buildings; is also extensively used for factories and residences, and for buildings of every class and character where perfect ventilation is desired.

"Globe" Ventilators are furnished with round or square base, and with glass tops when desired.

*Write us today for prices and further information*

**Globe Ventilator Company**  
203 $\frac{1}{2}$  River Street      Troy, New York

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### Economy in Construction

Every contractor is interested in methods which will save time in construction and in materials which will give satisfaction in use. The equipment made by the American Cement Machine Co., 1120 Johnson St., Keokuk, Ia., is designed to be of material benefit to the contractor. The



A Combined Mixer and Hoist.

mixer shown in the cut herewith is one of the machines which means money to the contractor as it combines a hoist with the mixer and permits either to be used without the other.

This is only one of the labor saving machines shown in the complete catalog of the American Cement Machine Co., and our readers can obtain the complete catalog on request.

### The Barbee Air Grate

Practically every building has under it one or more spaces which require ventilation. Where a building rests on a wall extending only below frost line without a basement or under porches and similar places there is always danger of dry rot in the floor joists unless some provision is made for ventilation.

The Barbee Air Grate, made by the Barbee Air Grate Co., Owensboro, Ky., is de-

signed to overcome the objections to the usual means of ventilating these places. The grate is so made that it can be easily closed so as to be practically air tight when no ventilation is wanted and can be as easily opened when required. Another place where the Barbee Air Grate is valuable is in the fresh-air inlet for a hot-air heating plant. This will enable one to readily shut off as much of the air as is necessary when the weather demands it.

The Barbee Air Grate Co. have a circular showing the construction of their Grates, describing their many uses and giving weights, prices, etc., which will be sent to our readers on request.

### Kellastone Imperishable Stucco

Every Architect and every Contractor wants to make his buildings look a little better than the surrounding ones. Some think that this can best be accomplished by carefully watching the workmen while others are always on the lookout for some new material or method which will give them the results they want. The National Kellastone Co., 505 Association Bldg., Chicago, Ill., have a booklet describing their products and showing how they are better than other materials commonly used. This booklet will be of interest to the progressive architect and contractor as it will enable him to convince his clients that the new building will have a distinction of its own in the neighborhood and will be held up as a model building as regards the construction and general appearance.

### How to Judge Engines

The selection of equipment is of vital interest to the contractor as it is one of the easiest means of reducing his costs, increasing his business, and adding to his profits. Unless he has owned and operated a gasoline engine all engines will look alike to him. Unless he can discriminate between enamel in colors and good workmanship and materials he is apt to be misled by a highly decorated but otherwise useless piece of equipment. The Witte Iron Works Co., 3186 Oakland Ave., Kansas City, Mo., in their catalog No. 46, describe in detail their various styles and sizes of engines, pointing out the various places about an engine which the contractor should examine when making a selection. The catalog indicates

WHEN you build of concrete, stucco or plain cement, waterproof the walls. Make them absolutely tight—so that rain and snow can't seep through. Two coats of

# Bay State

## *Brick and Cement*

# Coating

will do the job. This Coating is a permanent finish—has been tried and proved for fifteen years by builders in all parts of the country. It comes in white and a variety of colors. Wipes out the ugly blue-gray color of cement and gives pleasing artistic effects not otherwise possible.

As an interior finish, Bay State Coating is unequaled. It "Lights Like the Sun," is fire resisting, and doesn't chip or peel.

### SAMPLE CAN FREE

*Just write for it, specifying color you prefer. Try it out. Also ask for color card and booklet 15.*



## WADSWORTH, HOWLAND & CO., Inc.

*Paint and Varnish Makers*

**Boston, Mass.**

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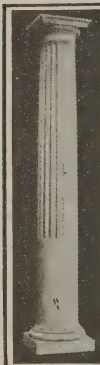
## Lumber and Building Material at Wholesale Mill Prices

We want every contractor and home builder to write us for our lumber catalog. It will give you our latest wholesale prices on all grades of lumber delivered to your station, and will explain to you our liberal plan of doing business.

Lumber bills and millwork furnished promptly and accurately for all kinds of buildings at lower prices than ever before quoted. Estimates furnished promptly. Send us your bills for our low delivered prices.

**Book and Samples Free** Write us today for our up-to-date price catalog and information whether you wish to buy or not. Asphalt roofing and shingles sold at less than factory prices. Write for samples.

**HOME LUMBER & SUPPLY CO.**  
343 S. Dearborn St., Dept. 9 Chicago, Ill.

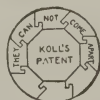


**SEND 10c in stamps for Catalog T 40** on Exterior and Interior Columns, or for our beautiful Pergola Album T 28, illustrating pergolas, garages, lattice fences, veranda treatments and garden accessories.

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LOCK  
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## Build For An Income



Buy a Plan Book of Flat Buildings and plan an income in your old age. Our book gives you ideas from two-family flats to twelve families, and our prices are reasonable.

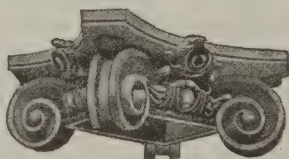
First edition (right off the press) . . . 50c  
Also a book for residences . . . 25c  
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**Standard and  
Special Designs in  
Interior and Ex-  
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In Plaster, Cement  
and Composition



Send us your blue prints for fine residence, theater and other public building work. Beautiful designs; best workmanship. Unusually low prices.

**Architectural Supply Co.**

Harry A. Lang, Prop.

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the care used in the selection of materials of the Witte Engine as well as the superior quality of workmanship in their manufacture. The catalog also shows the weights of the various machines and the freight rates to practically every point in the United States and Canada on each of their machines. The contractor is therefore posted on the various styles and sizes of engines and should make no mistake in his selection. The catalog, which is beautifully gotten up in colors, will be sent to our readers on request.

### Trying a Floor Scraper

Whenever a new device comes out one is not quite sure whether it is just the machine for them or not. In most cases a trial is out of the question and in some cases the purchaser is left with an unsuitable or an unsatisfactory tool device, or machine on his hands.

The Weber Mfg. Co., 661 71st Ave., West Allis, Wis., believe in giving the contractor ample opportunity to examine and test by actual operation their double action floor scraper. They are offering our readers at this time to allow them to use the scraper for five days before deciding whether it is just the one for their purpose. Those of our readers who want to take advantage of this offer should correspond with the Weber Mfg. Co. at the above address.

### A New Breast Drill

The line of Breast Drills made by the Millers Falls Co., Millers Falls, Mass., has had an addition to it in the shape of the Breast Drill shown herewith. The inten-

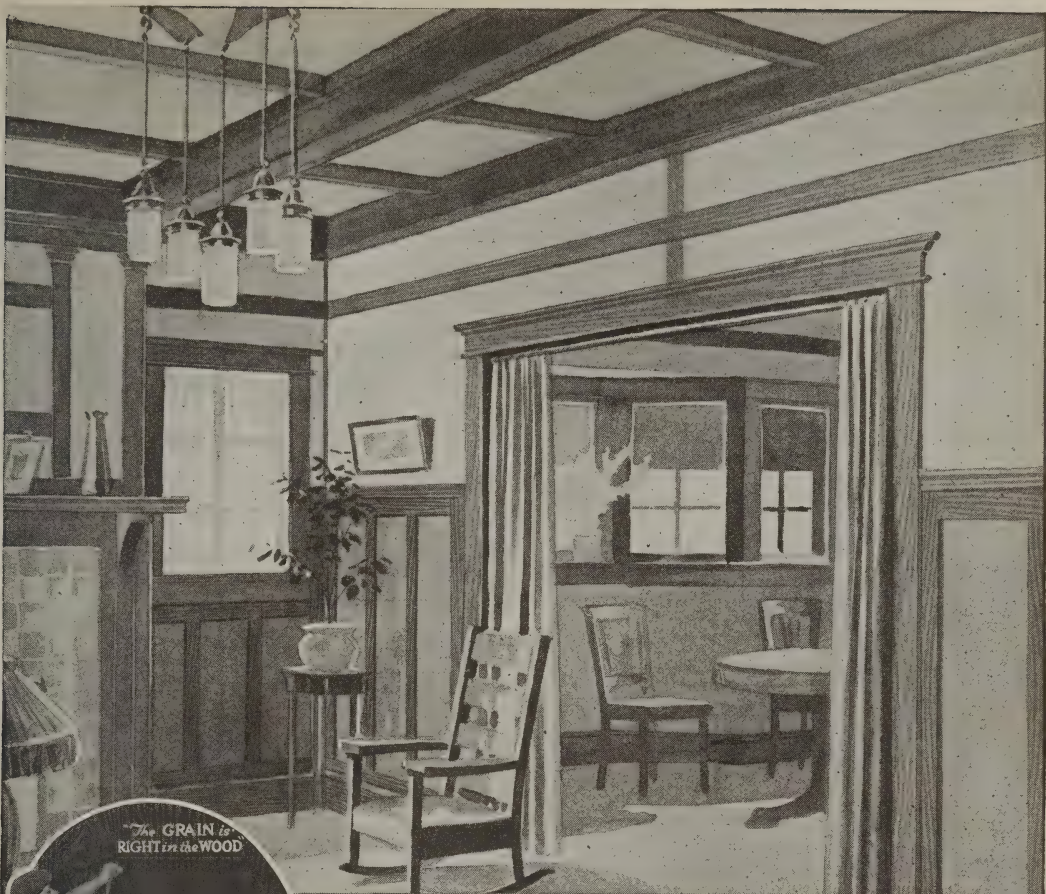


The Millers Falls Breast Drill.

tion of the Millers Falls Co. in designing this drill has been to produce a tool of the usual standard of workmanship, but at a lower cost than similar Breast Drills now on the market.

While the Breast Drill has the appearance of costing more than it does on account of the handsome finish and workman-

Advertisers' Section.



"The GRAIN is  
RIGHT in the WOOD"

# Fiberlic

## Wood-Grain Panels

Overcome the Cost of Wood

Every contractor and builder can now recommend decorative grained panels for interiors with absolute confidence, for the use of Fiberlic not only effects a big saving in this class of work, but it is also the equal of the real grained wood in appearance, strength, rigidity and endurance. Write for samples and prices; you will be surprised; you will see the great, new field that Fiberlic opens up for you; you will see at a glance the profit there is in handling this new product.

### Fiberlic is not a "Wall Board"

Fiberlic grains are right in the wood, not merely printed on the surface or printed paper mounted on boards, as in the case of "wall boards." Fiberlic grains are in the wood—faithfully reproduced from the real wood by an exclusive process. There is no limit to the color effects that can be worked out with Fiberlic—another advantage over "wall boards." See the samples, they are most convincing.

### Fiberlic Also Comes Plain For Walls and Ceilings

There is no loss in handling Fiberlic, as there is in sand, lime and laths. There is no comparison between Fiberlic and "wall boards." Fiberlic is made from long, imported root fibers, well known for their remarkable toughness, strength, and insulating qualities.

Write at once for Samples, Prices and Specifications

THE FIBERLIC COMPANY,

CAMDEN, N. J.

140 Washington Street, North, Boston, Mass.

**FIBERLIC**  
Wood-Grain  
Panels for  
Dining Rooms  
Living Rooms  
Halls  
Stairways  
Dens  
Bungalows  
Partitions  
Store Windows  
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No Contract too Large  
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## THE NORTHWESTERN TERRA COTTA CO.

Nor too Small to Receive  
Proper Attention

Office and Works:  
2525 CLYBOURN AVE., CHICAGO, ILL.

## Are You Going to Build?



Send 25c in silver (and 10c postage) for our big \$1 book of plans. "LOW COST MODERN HOMES," with houses from \$1,000 to \$3,000. "PALATIAL MODERN HOMES" from \$3,000 to \$10,000, price 25c and 12c postage. "COTTAGES AND BUNGALOWS" from \$300 to \$9,000, price 25c and 5c postage.

**J. H. DAVERMAN & SON, Architects**  
1342 Murray Building GRAND RAPIDS, MICH.

## DO YOU KNOW

Mr. Home Builder, that the cellar of your residence can be made absolutely and permanently watertight by the simple application of 1" finish of Portland Cement with Bitu-Mortar Waterproofing Compound added, over the inside walls and floor?

Let us tell you about our products.

The Bitu-Mortar Waterproofing Company

**BITU-MORTAR  
WATERPROOFING**  
WATERPROOFS PERMANENTLY

Engineers, Contractors and Manufacturers  
340-342 East 27th Street New York, N. Y.

THE ROCK OF AGES CLEFT FOR YOU

RED GREEN  
PURPLE BLACK  
**SHELDON'S  
SLATE**

THE ROOF FOR AGES ALWAYS NEW

Artificial substitutes bring endless expense for upkeep. Post a postal and get posted.

**F. C. Sheldon Slate Co., Granville, N. Y.**

ship there has been nothing skimmed in the manufacture and materials. On the contrary the highest grade of materials are used throughout and the drill is capable of doing work not ordinarily considered possible in a device of this character.

This Breast Drill is shown in detail in the complete catalog of the Millers Falls Co., which will be sent on request.

### Sash Weights

There was a time when it was considered that any old metal was good enough to make up into sash weights. Rusty tin cans and old iron generally was used for the purpose. Of course, this gave the desired weight, but it was more or less at the expense of looks and there was always a certain proportion of broken weights as well as imperfectly formed eyes which usually meant sorting over a pile of weights to get one which was exactly right.

The Ream Foundry Co., Lebanon, Pa., make a specialty of sash weights of all sizes and styles. Their price list and list of stock sizes will be sent to any of our readers on request and it will show them the advantage of having first class weights for use on any of their buildings.

### Selecting the Colors

The painting of the residence should never be left to chance, to the accidental taste of the workman. The selection of the paints, and the component colors, demands the best thought of the contractor for the paint entirely covers the contractor's work. Unless it is pleasing few owners will consider the good workmanship of the frame or the quality of the lumber, all hangs on the first appearance.

If one is an artist, he may make up a pleasing color scheme, but if not, isn't it better to trust that part of the work to some one who knows what is right?

The Carter White Lead Co., West Pullman Station B, Chicago, Ill., has been giving our readers some very interesting talks on Quality in Paint and we know that many have been following these talks closely. The latest Carter publication is "The Paint Beautiful," which gives a number of interesting and artistic color schemes showing the home as it will actually appear, in colors. The booklet is accompanied by a small

Advertisers' Section.

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## Go As Far As You Like

—you'll never find another building material or wall lining like this—none so strong and flat, with so slight a tendency to warp or shrink, none so easily handled, sawing so clean and smooth with so small an amount of litter; none so durable; none with such a stubborn resistance to air, cold, heat, moisture and fire; none so adaptable.



Trade Mark Reg. No. 94745

has all these features in its favor, because it is the only material of its kind with a center core of kiln-dried wood slats.

Get Compo-Board, when you ask for it. You can't be fooled if you look for the wood core, for it is easily and quickly identified.

Sold by dealers everywhere in strips four feet wide and in even lengths up to 18 feet long. Write for interesting book and free sample piece.

**Northwestern Compo-Board Co.**  
5776 Lyndale Ave. No.  
Minneapolis :: Minn.

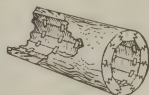
## Each of These 8-ft. Columns is Sewed with 160 Steel "Stitches"



When the staves are glued together under hydraulic pressure, locked with a double V joint, and sewed together with cold rolled steel staples every few inches, then—

The column will last in the hottest, coldest and dampest climates. *Steel-Sewed Columns* are made that way; no others.

Catalog tells all about columns; write for a copy.



**AMERICAN COLUMN COMPANY**  
120 South Ave. - Battle Creek, Mich.



The Palladium Skating Rink, St. Louis, M.

CAREY

# Ceil-Board

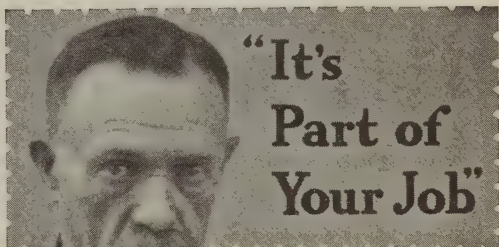
SUPERSEDES PLASTER FOR WALLS AND CEILINGS

28,000 square feet of Ceil-Board were used on the ceiling of the skating rink shown above. This is illustrative of thousands of Ceil-Board jobs that can be had by the wide-awake contracting carpenter if he is familiar with this modern wall covering.

That Ceil-Board is being specified by more architects than any other wallboard means something. It means that architects and contractors who are directly responsible to building owners realize that the scientific construction of Ceil-Board and the reputation of its makers warrant their recommendation. Get samples and full information for the Spring work.

**THE PHILIP CAREY COMPANY**

General Offices 1022 Wayne Ave, Lockland, Cin. Ohio  
OFFICES & WAREHOUSES IN PRINCIPAL CITIES



## "It's Part of Your Job"

Every good carpenter should know how to put up Beaver Board. Knowing how means money in your pocket and more jobs after people see your work.

You'll find it a real pleasure to work with Beaver Board, like you do any fine lumber. Beaver Board can't crack, is permanent, is sound and climate-proof, and has a fine surface for decorating.

Ask the makers to put your name on the list of their Builders' Service Department. Ask at once for free book, and a piece of the board, painted.

TRADE MARK



**The Beaver Board Companies**

United States: 663 Beaver Road, Buffalo, New York  
Canada: 863 Wall Street, Beaverdale, Ottawa  
Great Britain: 4 Southampton Row, London, W. C.  
BRANCHES IN Baltimore, Boston, Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Minneapolis, New York, Omaha, Philadelphia, San Francisco

# BEAVER BOARD

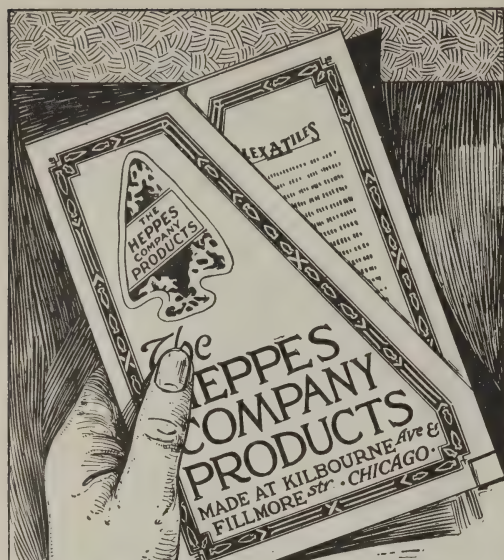
WALLS & CEILINGS

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# Get This

## Reference Book on Roofing

**JUST** off the presses. Our new handsomely illustrated roofing reference book. Of interest to every contractor, builder and carpenter.

It explains all about our various brands of roofing and shows the actual colors of our sturdy asphalt shingles *just as they look on the roofs.*

### Liberal Free Samples of the FLEX-A-TILE "GIANT"

a new asphalt shingle accompany the reference book.

Flex-A-Tile "GIANT" Asphalt Shingles are 50% thicker, 50% heavier and 100% stronger than the standard asphalt shingle. This means a 25% saving in labor.

Flex-A-Tiles are also made in standard weights and can now be had in five (5) handsome colors red, greenish gray, garnet, emerald and brown. See Reference Book for full information.

Flex-A-Tiles make handsome roofs and afford you handsome profits.

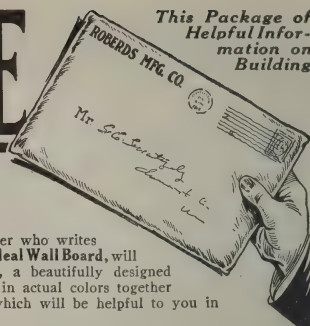
Drop a postal or write today and we will send book and samples for your files. This reference book is one that every contractor, builder or carpenter can show to his prospective customers.

**THE HEPPES COMPANY**  
*Manufacturers Also of Asphalt Paint, Asphalt Roll Roofing in Any Finish and Utility-Board, the Preferred Wall-Board*

1012 So. Kilbourne Ave., Chicago

# FREE

*This Package of  
Helpful Infor-  
mation on  
Building*



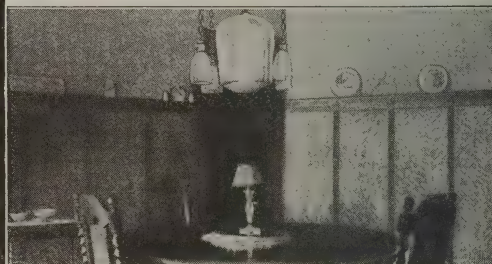
### To All Carpenters and Builders

Every carpenter and builder who writes for samples of **Roberts' Ideal Wall Board**, will be given absolutely **free**, a beautifully designed panel showing our boards in actual colors together with useful information which will be helpful to you in your daily work.

#### **ROBERTS' IDEAL WALL BOARD** "The Guaranteed Moisture Proof Wall Board"

Don't delay—write today for the free package—it's yours for the asking; also samples of our wall boards in gray, tan, mission and quarter-sawn oak.

**THE ROBERTS MFG. CO., 104 Railroad Ave., Marion, Ind.**

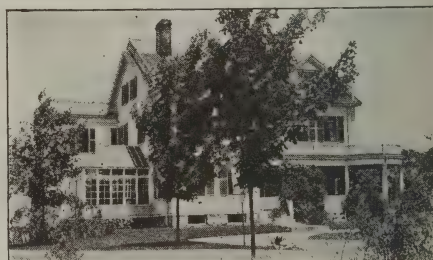


ROBERTS' OAK WALL BOARD used in paneled dining room in residence of Arthur G. Wade, Oak Park, Ill.

# STEARNS

## —of Boston

—can give low prices and prompt shipments to Eastern builders on **lumber, millwork and other building material.** Prove it by getting our estimates.



We handle all woods but specialize on Cypress; 12 to 15 million feet always on hand, ready for shipment in any quantity to Eastern buyers, or in car lots to any address in the world. By all means get Booklet No. 25, called "Cypress Lumber and Its Uses."

**The A. T. STEARNS LUMBER CO.**  
25 Taylor St., Neponset, Boston, Mass.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.

can containing color panels, so that the contractor can readily select harmonious colors for the buildings he has under consideration. Many of the panels show a variety of shades indicating the possibilities of Carter Paints.

This booklet and panels have been prepared for our readers at considerable ex-



Valuable Paint Information.

pense, and we are sure they will be of value to every one. The Carter White Lead Co. will send them to our readers on request, and if desired will place our readers on their mailing list for the "Carter Times," which contains much information of value about paints and painting.

### Grand Opening

The opening of the new factory building of the C. H. & E. Mfg. Co., 319 Mineral St., Milwaukee, Wis., indicates the advance which this progressive company has made during the last few years. The new building is equipped to manufacture a very complete line of contractor's equipment such as pumps, hoists, saw rigs, etc. Those of our readers who are not acquainted with the C. H. & E. line should secure their general catalog showing the machines and thus be prepared to increase their equipment with the most satisfactory apparatus.

### Shelf Pins

The cabinet maker as well as the jobbing carpenter is often called upon to provide neat shelving in cabinets, bookcases, sideboards, etc. Unless the shelving is put up substantially there is great danger of considerable loss through breakage of fine china

Advertisers' Section

## We want to get you better acquainted with the "YANKEE" No. 90 PLAIN SCREW DRIVER

*Guaranteed  
not to turn  
in the  
handle*

*You can't  
do it—  
try any  
way you  
like*



**The best  
proposition  
you ever saw  
in a plain driver**

**15 Sizes**

*Your dealer can supply you*



Let us send you the "YANKEE"  
Book. A postal brings it

**North Bros. Mfg. Co.**  
Department N, Philadelphia, Pa.

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## A SPECIAL OFFER to Home Builders and Contractors

Your copy of our Bungalow Folder just off the press is ready for you. Enclose 4c in stamps to cover mailing cost.



### Send For It At Once

It shows plans and elevations of buildings costing from \$2,000 to \$4,000.

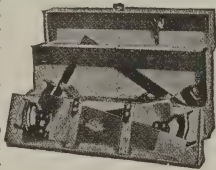
Complete Plans and Specifications as Low  
as \$5.00 Per Set

The Bungalow Specialists, 2148 So. Kedzie Av., Chicago

## INDESTRUCTIBLE Carpenters' Tool Cases

Stronger than any wooden chest, much lighter, holds tools better, much easier to carry. Same shape as a suitcase when folded and carried like one.

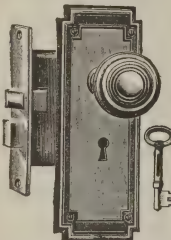
Made of 3-ply veneer, covered with heavy canvas and painted. Edges and corners are bound and reinforced with steel. Two brass catches and locks. Contains a place for every tool. Two sizes—31 in. for 26 in. saws, 33 in. for 28 in. saws. Will last a lifetime. Write for booklet and prices now.



**WEDELL & BOERS**

157 Jefferson Avenue, DETROIT, MICH.

## May Bargain 37c PER SET



Set 111 H W—Lock complete with 1 pair Knobs and 2 Escutcheons 2 $\frac{5}{8}$ "x7".

Steel, Old Copper or Dull Brass Finish.

Send for our new No. 7 Hardware Catalog, Free.

**Cobb, Whyte & Laemmer Company**  
Dept. 7 177-179 N. Clark St., Chicago

## BUILD YOUR OWN GRANDFATHER'S CLOCK

With Our Help

We furnish blue prints, finishing material and instructions. Buy the works, dial weights and pendulum from us at surprisingly low prices.

You make a fine profit building artistic clocks for your friends.

Complete works, \$5.00. Others with chimes at all prices.

Ask for attractive free offer.

**CLOCK COMPANY**  
1657 Ruffner St., Philadelphia, Pa.



PASTE THIS DOME  
WRITE TO ADVER-



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TISERS. IT HELPS.

and glassware, as well as damage to valuable books, etc. To overcome difficulties of this character, Mr. J. D. Johnston, Newport, R. I., has invented a patent shelf pin which obviates much of the difficulty which the cabinet maker finds when working about this form of construction. These pins are amply strong to withstand any load which will be placed upon them, while their design is such that any desired arrangement of shelving is possible. We understand that Mr. Johnston has made arrangements to send not only a description of these pins but actual samples, from which the cabinet maker can properly judge their full value for his work.

### Various Types of Roof Coverings

In a great many countries the contractor does not have a wide variety of roofing materials to choose from. He is obliged to use the materials which can be obtained. This fact has been responsible for a great many forms of roofing in the past, but the general advance in building construction, especially in the United States, is rapidly developing better forms of roofing materials.

A roof must do more than shed the water, it must protect against the summer's heat and the winter's cold. It is rapidly becoming a requirement that the roof must be fireproof also, as in no other way can the spread of flames be so easily prevented.

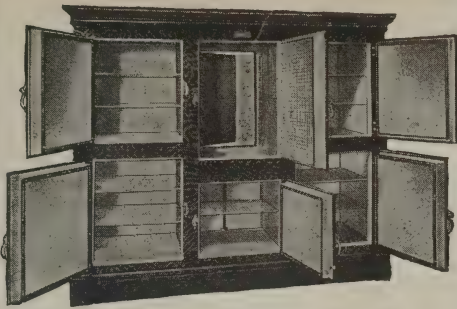
The Asbestos "Century" Shingle, made by Dept. H. of the Keasbey & Mattison Co., Ambler, Pa., is the product of much scientific investigation and research.

The shingle is in general composed of Portland Cement and asbestos, making it not only absolutely fire-proof, but also proof against all kinds of weather. These shingles are made in a number of styles and sizes so that the contractor can use considerable taste in arranging them on the roof. Those of our readers who are not familiar with these shingles should secure the information in regard to them which the Keasbey & Mattison Co. will be glad to send, as well as prices, terms, etc.

### The Julien Coal Chute

The use of the coal chute is necessary in every building in which coal, wood or vegetables are stored. While the coal chute is merely a means of entrance to the building

Advertisers' Section



**A GOOD REFRIGERATOR** must have real inside value to secure satisfactory results.

Real value means—perfect insulation of all walls, close fitting doors—positive circulation of pure air—inner walls that can be kept clean and sanitary.

You can always feel safe in buying for your own home and in specifying, recommending and installing the **Herrick** for homes, hotels, stores, clubs, cafes, etc., you are building.

We want to send you **free plans** and specifications for outside icing, they are inserted in back of new Catalog No. 23 N which is free on request.

**Herrick Refrigerator Co., Waterloo, Iowa**



# Herrick

## Neptune

### Gasoline Storage System

Sell them to building owners who have automobiles, or who store gasoline. Easily, quickly and profitably installed by contractors. Low price of \$15.00 makes the *Neptune System* a ready seller.



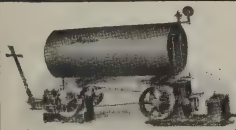
Our 68V System is approved by Underwriters. Tank has one-barrel capacity—larger if desired; galvanized inside and out. Tank is installed underground. Pump is all brass. Write today for catalogue and full description.

**Fleck Bros. Co.**  
52 N. 5th St., Philadelphia, Pa.

# \$15

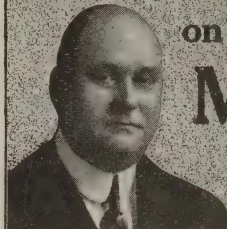
### Neptune Pneumatic Water Supply Systems

For country and suburban homes; operated by hand, gasoline engine or electric power; easily and profitably installed by contractors. Write for complete information and trade terms.



# Save 50%

## on Your Building Material Bill!



**LET** me send you our Building Material Catalog showing 8000 price bargains on building material and also our Plan Book showing views and floor plans of 50 modern Houses and Bungalows. They will prove you can build, remodel or repair for much less than you expected. We ship everything everywhere in the way of high grade lumber, flooring, roofing, doors, windows, storm sash, moldings, porch work, screens, hothods, building hardware, paints, wallboard, plumbing, heating and water supply outfits, cement machinery and interior woodwork. All at Wholesale Prices Direct to You. Quality, safe delivery and satisfaction absolutely guaranteed. Building Material Catalog Is Free.



**Material Complete for Houses from \$398.00 up**

**CHICAGO MILLWORK SUPPLY CO.**  
"AMERICA'S GREATEST SASH AND DOOR HOUSE"

*W. H. Manning* Pres.

### BUFFETS

# \$17.00

and up

Built-in Cases for every purpose are shown in our free catalog



Our Big Free CATALOG shows our full line of Colonnades and Grilles

This Bookcase COLONNADE complete as shown 8 ft. x 8 ft. Yellow Pine

**\$22.50**  
Oak, Birch or Cypress  
**\$23.50**

Beautifully Illustrated PLAN BOOK

Don't plan to build, remodel or repair until you see these two books

Catalog of 8000 Price Bargains

Mail address on coupon today

Address .....  
Town .....  
State..... R. F. D.....

**Chicago Millwork Supply Company**  
1423 W. 37th Street  
Chicago, Ill.

Please send me your Free Building Material Catalog. (If the Plan Book is wanted, send 10c for mailing.)

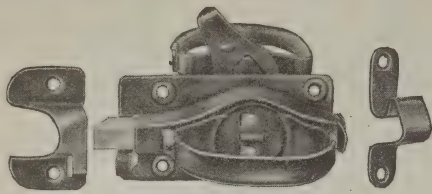
PASTE THIS DOME  
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ON LETTERS YOU  
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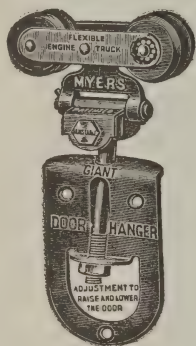
## Whitcomb Steel Barn Door Latch



Over 13,000 Dozen Sold Last Year

A strong, durable, convenient latch, adjustable to doors of any thickness; will not catch harness. Two large handles permit opening of doors from either side. Each latch provided with two catches to hold door open and closed. Also arranged for use of a padlock.

Albany Hardware Mfg. Co., Albany, Wis.



## MYERS GIANT

and New-Way  
Adjustable Tendem  
Door Hangers

PATENTED

For Tubular Girder Track

Are adjustable up or down, and in or out. Trolley Wheels are heavy turned steel, revolving on steel roller bearings, and run inside the tubular girder track. Not affected by rain, sleet or ice. Write for descriptive circulars and prices.

F. E. MYERS & BRO.  
ASHLAND, OHIO



SUN-RED  
SELVAGE

## Rust-Proof Alumina

is a 10-coat electro-galvanized Window Screen Cloth—electrically applied after weaving. It is guaranteed to last from 2 to 5 times as long as any other Galvanized Cloth on the market.

We furnish Screen Makers and Mill people with free printed Folders for their trade. Write for free samples.

Reynolds Wire Co. - Dixon, Illinois



Antique  
Copper  
Finish  
Sash Lock  
No. 5493

40c  
Per Doz.

Rehm's New Catalog is ready for you. Write now; it's free. Shows fine big line of builders' hardware, tools, etc.

We do not sell to contractors in Cook County, Illinois.

REHM HARDWARE CO.  
1503 Blue Island Ave. Chicago, Illinois

it must be substantially made to prevent its being damaged while in use as well as to keep out intruders at all times.

The Julien Coal Chute, made by the Loetscher-Ryan Mfg. Co., Main St., Dubuque, Iowa, possesses features which makes it desirable in every building. When closed it can be opened only from the inside and serves as a window. When open the glass is protected by a metal shield. A circular which the Loetscher-Ryan Co. has prepared shows the Julien Coal Chute in place, as well as in detail and also gives prices on the various styles and sizes made.

## Two Important Questions

One of the first questions asked the contractor is, "What will it cost?" The second, and equally important question, is, "What will it cost for repairs?" The Cortright Metal Roofing Co., Philadelphia, Pa., believe that in their metal shingles they have the ideal material for roof covering and that the first cost is low, with the repair cost practically nothing. Considering the expense which usually accompanies other forms of roofing it would seem well for our readers to investigate the special proposition which the Cortright Roofing Co. is making to our readers and to send for the illustrated catalog of the Cortright Metal Roofing Co.

## Tyscru

Reinforced concrete can be used without some of the labor saving devices and appliances which this construction has developed. To do so, however, means a loss of time, a loss of money and a waste of money and a waste of labor.

One of the devices of great interest and value to the contractor is the Tyscru made by the Unit Wall Construction Co., 1328 Boardway, New York City. This device consists of a tie which insures proper spacing and thickness of walls and yet leaves no holes for leakage such as occurred with other forms of ties and braces. The tie being left in the concrete and thoroughly imbedded serves as additional reinforcement.

The Unit Wall Construction Co. have circulars showing the great variety of places in which this device is especially valuable. The circular also shows the various styles

Advertisers' Section.

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WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.

# —if you don't object to paying less and getting more

on your millwork purchases, you are requested to investigate our proposition.

We claim—nothing! But we do state the following facts for your consideration:

By carrying in stock (*all* the time) over seventy-five carloads of millwork, glass and paint; and having over a million feet of shop lumber

in our yards — *we can give you the SERVICE!*

Having the largest mill in the country devoted to the contractors' trade; and maintaining our own art glass, beveling and silvering shops—*we can quote low prices.*

And our policy of selling nothing but high-grade goods enables us to promise *quality products.*



Write for Sash and Door, Mantel, Art Glass or  
Paint Catalogs

**The Cleveland Window Glass & Door Co**  
CLEVELAND OHIO



## PEARL Screens Are Still New When Others Are Gone—

Does that sound like a pretty strong statement? Let us prove it.

First of all, genuine Gilbert & Bennett PEARL Wire Cloth derives its rust-resisting qualities from the coating. This metallic protection is a secret composition, owned and controlled by Gilbert & Bennett. It will not crack, chip or peel off under any conditions whatsoever.

GILBERT & BENNETT  
**PEARL**  
WIRE CLOTH

**For Screening Doors,  
Windows and Porches—**

**Made in Two Weights  
Regular and Extra Heavy**

PEARL is handsome—its original bright metallic lustre with a short exposure to the weather turns a permanent "invisible gray" and stays that way.

The thing that's making PEARL sales bigger every year is the fact that it requires no paint or repairs—it represents true screen economy.

Don't be deceived. There can not be a "just the same as PEARL." The manufacture and application of the non-crack, no-chip coating from which it derives its wonderful rust-resisting qualities is a secret process; the exclusive property of this company. But to be sure of PEARL wear you must get genuine PEARL Wire Cloth, two Copper Wires in the Selva and the Round Tag bearing the Gilbert & Bennett name on each roll.

Write our nearest office for samples of both Regular and Extra Heavy PEARL, full details regarding same, and the name of the nearest dealer.

**The Gilbert & Bennett Mfg. Co.**  
(Established 1818)

Dept. S, 277 Broadway, New York  
Georgetown, Conn.

Dept. S, 38 S. Dearborn St., Chicago  
Kansas City, Mo.

**The Best Hardware  
Dealer in Your City  
Sells "PEARL"**

**FREE Samples and  
Booklet**  
Write our nearest office.





## A SHINGLING HATCHET

WITH POSITIVE GAUGE

Carpenters and Builders—Here is a hatchet you can do some fast shingling with—No. 144 (oval head, 169 points.) Gauge is positive—cannot slip. Clamps on with screw; gauge is readily changed. This hatchet is also made with flat head No. 44, 81 points, milled. Price of either, \$1.75 postpaid. We make a complete line, and the best, of Lathing Hatchets, from 64 to 225 points. Prices \$1.40 to \$1.75. You get full money value in a Sayre Shingling or Lathing Hatchet. You can be positive of that. At your dealers or sent direct.

L. A. SAYRE & SON  
340 Mulberry St., Newark, N. J.

## Galvanized Iron Cut Nails

For shingles, slating, boat and wharf building, fencing, sheathing and all exterior work use

### Anchor Brand Iron Cut Galvanized Nails

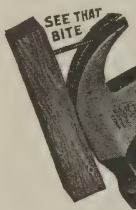
as they will outlast the best of wood under all climatic and weather conditions.

Write for Prices

E. & G. Brooke Iron Co., Birdsboro, Pa.

**\$1.00**  
and Your  
Dealer's  
Name—

brings the "Vandor" Vanadium Nail Hammer to you by parcel post. Guaranteed for a lifetime—will give you a new one if the one you buy proves defective.



Drop forged from toughest Vanadium steel; second growth shaved Hickory handle; will draw anything from a headless brad to a spike.  
No. 21½, 16 oz. Standard; No. 22, 13 oz. Gen'l Purpose; No. 22½, 10 oz., Finishing; No. 721½, 16 oz. Ripping. Either for \$1.00 and your dealer's name Order today.

VAN DOREN MFG. CO., Inc.  
(Vandor Dept.) 227 W. Erie St., Chicago, Ill.

## PEARSON'S AUTOMATIC SHINGLE NAILER

*Pays for Itself on the First Job*

Do your nailing faster and on any pitch of roof. Wear mittens or gloves. Great for use on stained shingle jobs.

Made in two sizes—BLUE for 3d common No. 14 gauge wire nails. RED for 3d galvanized No. 13 gauge 1½ in. wire nails. **Get a nailer direct from us.**

Money refunded if not as represented

PEARSON MFG. CO.

Mfrs. of Nailers and Tacking Machines  
Robbinsdale, Minnesota



List Price  
**\$7**  
Special Price  
**\$5**

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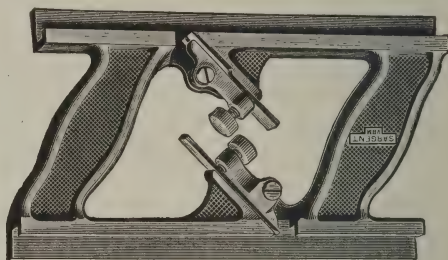


ON LETTERS YOU  
TISERS. IT HELPS.

and sizes as well as prices, etc. The Unit Wall Construction Co. is offering our readers a special discount at this time and our readers should be careful to ask for special discount sheet X when asking for information, prices, and other data.

### The Sargent Tongueing Plane

Through the courtesy of Sargent & Co., 52 Water St., New Haven, Conn., we are able to show a cut of their new Tongueing and Matching Plane. These planes are so designed that one side cuts the tongue while



A Tongueing Plane.

the other side cuts the groove to match it. In general construction they are light and compact and being flat are convenient to carry in the tool box or to keep in a drawer of the bench. These planes are made in a number of sizes so as to work on any thickness of lumber, each size being able to work on a varying thickness.

### Motor Trucks for Contractors

The use of Motor Trucks and delivery cars by supply houses, stores and other concerns has led many other business men to investigate the possibility of using them in their business. A careful study of the problem has usually resulted in the purchase of one or more cars, the style and size depending upon the nature of the business.

Many farmers have found that it was profitable to use a delivery car instead of a two-horse team when going to town, delivering produce, milk or securing supplies for the farm. Contractors have found that while the supply houses could and would deliver most of the material used that there were still many times when a delivery car was extremely valuable.

The Willys Overland Co., Toledo, Ohio, have established an entire Department, No. 256, to deal with the contractor's problems.

Advertisers' Section.



## Our Expert Service is Free to Architects

In our Draughting Department are experts who have devoted their lives to specializing in the preparation of floor plans for refrigerators and cooling rooms. Send your refrigerator and cooler problems to these experts, and carefully worked out Floor Plans, Estimates, etc., will be submitted without charge.

## McCray Sanitary Refrigerators

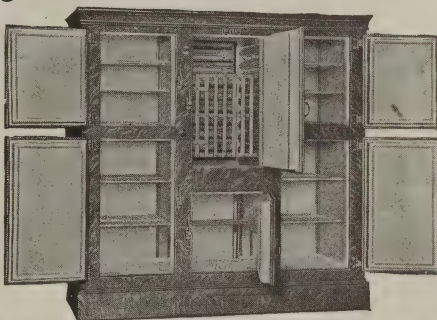
are built in a great variety of regular stock sizes—ready for immediate shipment—for every requirement of residences, hotels, clubs, restaurants, delicatessen stores, groceries, meat markets, florists, hospitals, public institutions, etc. Also Built-to-Order to fit any space or for any special purpose—arranged for either ice or mechanical refrigeration.

### Get Our Catalogs For Your Files

- No. 92—For Residences
- No. 50—For Hotels, Clubs, Public Institutions, etc.
- No. 69—Grocers' Display Refrigerators
- No. 61—Coolers for Meat Markets, etc.
- No. 73—For Florists

**MCCRAY REFRIGERATOR COMPANY**  
748 Lake Street      Kendallville, Ind.

Chicago—1000 S. Michigan Ave.      New York—McCray Bldg., 7-9 W. 30th St.  
For Salesroom in your city see Local Telephone Book



Give complete satisfaction on every shingling job. Your customers expect it. Your reputation demands it.

### USE ZINC-CLADS

—the shingle nails for unusual service. Guaranteed non-rusting. The strongest wear-resisting shingle nail for the price. Coated with molten zinc by the hot dip process.

Sold only in five-pound trademarked cartons. Get them at your dealers or direct from us.

**Price 8c Per Pound**

**W. H. Maze Company - Peru, Ill.**  
Sole Manufacturers of Zinc City (Pure Zinc) Shingle Nails



*Pick Your House  
Shingles from  
these  
Samples  
Sent  
Free*

These sample strips, cut from regular stock, show color and wood just as shingles look on house.

"Weatherbest" Stained Shingles are made only from the finest grades of Red and White Cedar Shingle stock. There is no more durable wood known.

"Weatherbest" Stain is a scientific combination of wood preserving elements with mineral and chemical colors. Under our process every shingle is treated with stain, not partly, as is the custom, but the entire shingle from tip to butt. This insures the longest possible wear whether for roofing or siding shingles.

*Ask us today for your free samples*

**TRANSFER STAINED SHINGLE CO.**  
158 Main St., North Tonawanda, N. Y.  
Makers also of the superior quality "Transfer Brand" Red Cedar Shingles. Demanded by knowing builders and sold by progressive lumber dealers everywhere.

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1853



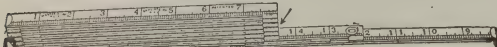
1914

**61 Years of Tool Making Behind  
Buck Bros. Products**



Our line of tools includes Gouges, Plane Irons, Chisels, Drawing-knives, Nail Sets, Screw-Driver Bits, Carving Tools, etc. Our reputation guarantees them all. Catalog shows them all. Write for it.

**BUCK BROS. : : MILLBURY, MASS.**



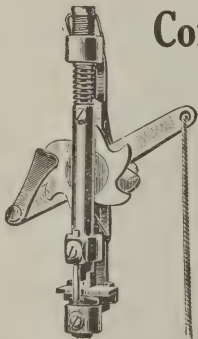
## Be An Agent for a Rule Every Carpenter and Builder Needs

Improved Interlocking Fool-proof **Master Slide Rule** gives inside as well as outside measurements of doors, windows and everything else instantly and accurately. Strongly made, rust-proof and designed to last many years.

Price 15c per foot, in sizes from 4 to 8 foot lengths. Order a trial rule.

Anyhow learn about our agency proposition. Circular B tells.

**DAHL MANUFACTURING CO.**  
51B East 42nd Street New York City

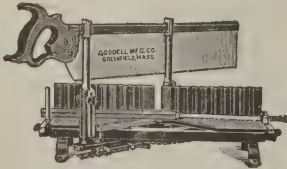


## Complete Saw Set only \$1.50

It pays to take care of your saws. The **Uniform Saw Set** is a mechanical device that gives just the right set to each tooth. Operates by tread; leaves both hands free. The "Uniform" will make your saws "live" longer. Send money order or check and get this tool by mail. Money back if not suited.

**J. O. Pettey - Belvidere, Ill.**

## GOODELL MITRE BOX Made of Steel ——— Cannot Break



Send for New Circular E

**GOODELL MFG. CO.,**  
GREENFIELD - - MASSACHUSETTS

**First in Quality  
& Improvements**

New **STEEL BOTTOM PLATES** with **ANGULAR SERRATURES** to prevent the work from slipping, and many other special features.

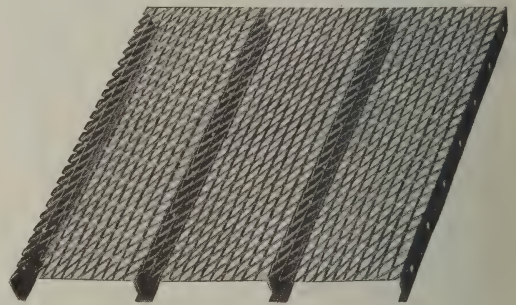
This department has made a study of the contractor's business and is in a position to advise intelligently regarding the style and size of car which will do the contractor's work to the best advantage and to give the contractor information regarding not only first cost, but the cost of maintenance, operation, etc. The department has a special contractors' delivery car catalog which will be of interest to our readers and which has been prepared for their especial benefit.

## A New Type of Reinforced Metal Lath

On a great many classes of work a special form of metal lath combining a furring or reinforcing with the mesh is found to be of great advantage. Such a material is particularly adapted for use in solid plaster partitions and for lathing suspended ceilings. A combined lath and reinforcing is also of material advantage as a form and reinforcing in the construction of concrete roofs and floors.

The material shown in the above illustration has just been put on the market to supply the demand for the class of metal lath outlined in the preceding paragraph.

The reinforcing or furring members of "Chanelath" consist of T-shaped ribs



Chanelath, a Reinforced Metal Lath.

spaced 4 inches apart and connected by a small mesh lath. The ribs are solid and the mesh extends in an unbroken surface across the entire sheet. This insures a perfect key when the "Chanelath" is to be covered with plaster.

The T-shaped ribs are very efficient when the "Chanelath" is used as a reinforcing for concrete because of their shape. Everyone familiar with reinforced concrete design knows that a twisted or deformed reinforcing member is much more efficient than one that is perfectly smooth.

Advertisers' Section.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



Goods Made by KEES  
Are Made to Please

## Less Labor—Lower Cost—Greater Satisfaction

You reduce building costs—eliminate tedious fitting and beveling—secure better results, neater and more durable siding corners—by using

## Kees Metal Building Corners

Made in all sizes—ready to nail on—especially treated in manufacture to hold paint or stain—easily put on—make perfect mitre without cutting siding to fit—almost invisible after painting—last a lifetime.

Write today for free samples, prices  
and profit-making particulars

F.D. KEES MFG. CO. BEATRICE, NEB.  
Box 811



## SAND'S ALUMINUM LEVELS

### WILL NOT WARP

Sand's Aluminum Levels are light, strong and durable. They will not warp, split or rust. Nothing to work loose or get out of order. Easy to handle. Need no adjusting. Made in 18", 24" and 30" sizes for Carpenters and 42" length for Masons. We also make a high-grade line of wood levels.

are honestly made of very high-grade aluminum specially prepared for this purpose. The finish is ideal and the greatest strength is placed where most needed. All unnecessary weight is left out. The plumbs are the best that careful experience can make. Each level is fully tested before it is offered for sale. You can count on Sand's Levels being perfect.

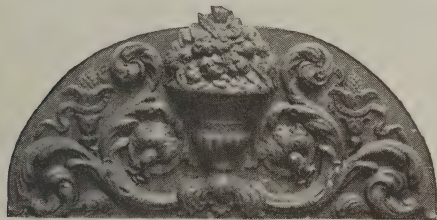
### ASK YOUR HARDWARE DEALER

to show you Sand's Levels. If he does not sell them let us know, and we will send you a circular showing full size view of our 24" Aluminum Level and 1/2 view of the 30". Just like seeing the actual levels.

J. SAND & SON, 1023 Rivard St., Detroit, Mich.

### Best Level To Use In Dark Places

The plumbs at each end and the double center level make it readable in any position and at arm's length. Pick it up any way. It is always in position. Vials covered with heavy plate glass which keeps out water, dust and dirt. A Sand's Aluminum Level will last you a lifetime.



## Don't Eliminate Ornate Effect

—from your designs on account of weight and expense.

If you cannot use heavy stone or cast ornaments or statues in your designs, consider light weight, substantial, enduring and economical sheet metal work. You can secure the maximum of artistic merit, all the elegance and refinement of the best sculpture, with a minimum of cost.

## Mullins Sheet Metal Ornaments

We have the skilled workmen and modern equipment to satisfy your needs in this kind of work. We have, too, the essential experience, gained from a quarter of a century of notable achievement.

Write us for information concerning the particular kind of work which you require. We shall be pleased to give you our prompt attention.

The W. H. Mullins Co., 210 Franklin St., Salem, Ohio, U. S. A.

## Send the Coupon

If you are ready and willing to handle more metal wall and ceiling contracts—sign and send the coupon below.

This will bring the KANNEBERG proposition—a plan by which a combination of low prices, quality products and efficient service will actually bring you more business. Send it now.

The Kanneberg Roofing & Ceiling Co.  
Dept. A, Canton, Ohio



The  
Kanneberg  
Roofing &  
Ceiling Co.,  
Dept. A, Canton, O.

Gentlemen:—As your products are better and your prices lower than ordinarily, send me full information.

Name.....

Street.....

City..... State.....

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## "Buckeye" Plane

The *better* plane. Will not clog, chatter or tear out, even when used against the grain in the most difficult wood. Cleans up veneer work as good as any veneer scraper.



Quickest, easiest, simplest to set. Takes three seconds to remove cap plate with bit and drop them into place again, and the bit will cut exactly the same thickness of shaving as before being removed. Can't be set wrong. Write today for literature and prices.

Satisfaction Absolutely Guaranteed  
BUCKEYE SAW VISE CO.  
2044 W. 55th St., Cleveland, O.



## An Opening for a Mortise Lock Can be Cut in Two Minutes by using the Miller Door Mortiser

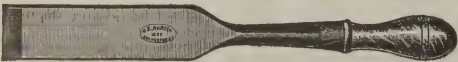
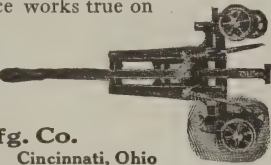
Little labor is required, and a perfectly true job is assured. Makes no difference what thickness the doors are, the device works true on them all. Complete with five cutters, covering locks from  $\frac{1}{4}$  inch to  $1\frac{1}{2}$  inches thick. A real time and labor saver. Sent subject to trial.

A. W. Miller Mfg. Co.

Riverside, Calif.

Cincinnati, Ohio

Our Butt Mortiser and Rule Gauge for 75 cents, Postpaid



## Tools Marked Like This



Last a Lifetime and Give Satisfaction to the End!

*The Highest Priced Edge Tools Made*

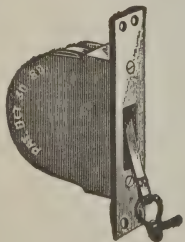
Ask for our catalog, book "True Stories" and "How to Take Care of Tools"—free.

**Mack & Company**

Brown's Race

Rochester, New York

## Caldwell Sash Balance



Does away with weight and cords and **vastly** more durable. Makes sashes work perfectly. Permits greater window space in new work, as box frames are not necessary. May be applied to old windows without altering sashes or frames.

Write for Circular to

**Caldwell Mfg. Company**

2 Jones St., Rochester, N. Y.

This new product is being marketed by the North Western Expanded Metal Company, 905 Old Colony Bldg., Chicago, Ill., and is furnished in sheets of any width that is a multiple of 4 inches up to and including 4 feet. The lengths are 6, 8, 9, 10 and 12 feet. Full information will be sent on request to the above company.

## Vacuum Cleaning

Some of our readers and in fact many of the general public believe that the Vacuum Cleaner is designed solely for the millionaire's house. The catalog issued by Dept. F of the Thurman Vacuum Cleaning Co., 11th and Monroe Sts., St. Louis, Mo., indicates that the seventy different types and sizes each have a separate purpose and are therefore adapted for practically every kind of a building.

The Thurman Vacuum Cleaning Co. advise us that they have a department which is prepared to assist our readers in locating and laying out the piping and other apparatus used in connection with their system and this will save the contractor a great deal of time besides preventing errors and accidents which might occur through attempting to install apparatus and equipment not entirely familiar to him. Those of our readers who wish to know more about Vacuum Cleaning should get in touch with the Thurman Vacuum Cleaning Co. at the above address and secure their free booklet and other information.

## Dumb Waiter Apparatus

The installation of a Dumb Waiter calls for careful attention on the part of the mechanic to the instructions which the manufacturer sends with the equipment. The Chelsea Elevator Co., 334 West 26th St., New York, have been making Dumb Waiters for forty years and their latest patent issued February 23, 1915, shows a valuable feature in Dumb Waiter construction. Through the use of the device just patented an unusual control of the car is given, adding greatly to the ease of operation as well as to the safety of the operator and of the goods placed on the Dumb Waiter.

The Chelsea Elevator Co. advise us that their latest catalog describes not only this latest device, but also about a dozen other

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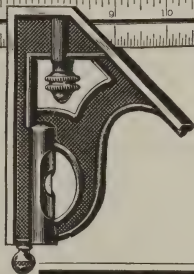
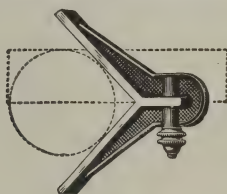
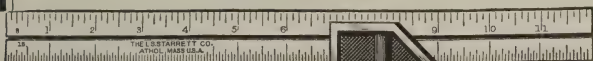
Advertisers' Section.

# The Handiest Tool In the Whole Tool Box

That's what an old carpenter who had spent nearly all his life at his trade said when asked what he thought of the

## Starrett Combination Square

He said it because he found he could do so much with it. He had used it on all kinds of jobs and under all conditions and found that it was as he said—the **handiest tool in the box**. He could use it as a rule, or a square, or a level, a depth gauge, and a bevel, and when serving as any of these it was perfectly accurate. **No wonder he was proud of it.**



If you ever use carpenters' tools you should look at our line. Send for Catalog No. 20 M and learn what tools we make for you.

**The L. S. Starrett Co.**  
Athol, Mass.

42-100

# CORTRIGHT

## METAL SHINGLES

**T**WO great questions with the prospective buyer of roofing are "how long will this roofing last," and "what will be the cost for repairs?"

Frankly we don't know just how long Cortright Metal Shingles will last. A great many Cortright roofs put on twenty-seven years ago are good as ever today and have cost nothing for repairs or replacements.

We have a great number of letters from contractors and builders telling of the satisfaction Cortright Metal Shingles have given customers during the ten, fifteen, eighteen or twenty years they have been handling them.

Our illustrated catalog and special proposition to contractors and builders should be in your hands.

**Write Now**

**Cortright Metal Roofing Co.**  
Philadelphia and Chicago

### NEVER NEED REPAIRS

## A Guaranteed Hatchet

No. KNH1  
Price \$1.15

**KEEN KUTTER**

Send for our Home Furniture Design Booklet No. M976.

"The Recollection of Quality Remains Long After the Price is Forgotten."  
—E. C. SIMMONS.

Trade Mark Registered.

If not at your dealer's, write us.

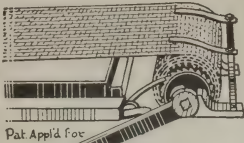
**SIMMONS HARDWARE COMPANY**  
St. Louis, New York, Philadelphia  
Toledo, Minneapolis, Sioux City, Wichita.

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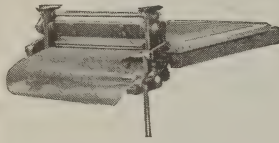


## SCHILLI Screen Stretcher

Pat Appl'd for

For stretching screen wire on the frame; does the work in one-fourth the usual time; keeps the wire taut and of a uniform tension on every square inch. Cuts down labor costs—makes every job pay more profit—greater satisfaction to customers. Simple, compact, durable. Write for description and prices.

**M. L. Schilli Mfg. Co., Pierron, Ill.**



## Miller's Screen Wire Stretcher

Will help you make screen doors and windows in half the time. Insures a snug-fitting, evenly stretched screen without sag. Saves its own cost. Operated by foot and holds wire tight until tacked.

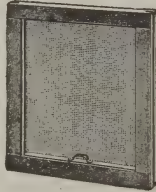
### Write Now For Circular and Price

on this and on my Sliding Arbor Cut-Off Saw, Clamping Bench and Laying Out Table, Moulding Mitre Cutter, etc.

**A. N. MILLER, 750 38th St., Milwaukee, Wis.**  
Manufacturer of Special Sash and Screen Making Machinery

## STANDARD Fly Screens

Made of Northern White Pine, with mortised corners. The Standard Shoulder Strip Method holds each strand of wire evenly and firmly. Easy to rewire. Standard Fly Screens are the standard of quality.



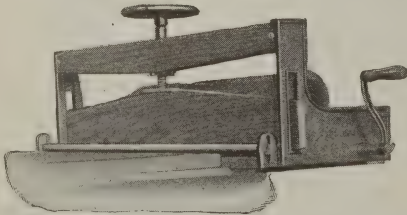
### MAKE IT YOUR BUSINESS

to sell Standard Fly Screens and Screen Doors. Send us your specification for estimate. Write for copy of new catalog.

### STANDARD SCREEN CO.

1848-58 Hastings St. Chicago, Illinois

## The ONLY MACHINE For Stretching Wire Cloth on Frames



Does the work quickly, evenly and without waste

Can be used by anyone. Will hold any width to thirty-six inches; larger sizes to order. Price Ten Dollars. If not satisfactory may be returned in thirty days.

**J. F. Schafer - Mount Pulaski, Illinois**

different styles of Dumb Waiters besides a complete line of Hand Power Elevators. It will be sent to our readers on request and will enable them to talk intelligently on the subject.

### Modern Barn Equipment

The farmer has already learned the value of modern equipment about his house and barn and the contractor appreciates the business which can be obtained through having a thorough knowledge of barn construction and equipment. The C. A. Libbey

## LIBBEY MODERN BARN EQUIPMENT



MANUFACTURED BY  
**C. A. LIBBEY CO.**  
OSHKOSH, WIS.

CATALOG No. 9

A Catalog of Barn Equipment.

Co., 182 Marion St., Oshkosh, Wis., are specialists in barn equipment and their new catalog, the cover of which is shown here-with, contains complete information regarding the design, construction, equipment and maintenance of modern dairy barns and other farm buildings. The catalog is well worth study.

### Saving Time

Some contractors save time by jumping at conclusions, rough estimating, and taking chances. Once in a while they come out all right but as a rule "luck" is against them. The contractor who considers his future takes every precaution to do his work right, to have his quantities right, and

Advertisers' Section

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PAT. 2-25-13



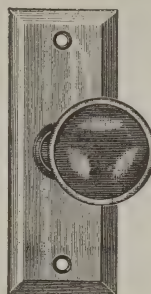
**WE** guarantee all sash weights shipped by us to have perfect eye, clear number and weigh true to mark. Clean castings without lumps.

Careful attention and prompt shipment of special weights.

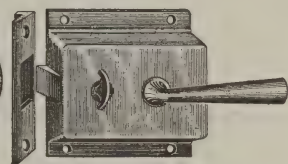
Price and list of stock sizes upon request.

**Ream Foundry Co.**  
Lebanon, Pa.

## Wrought Steel Rim Latch No. 129



Neat—Attractive



Durable—Economical

A perfect working, handsomely plated steel latch at a low price.

Gives perfect satisfaction. Not shoddy. Makes a neat latch for any screen door. Worth more, costs less than others not so desirable.

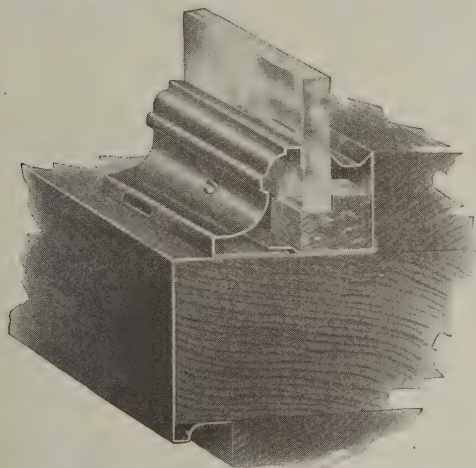
Ask your dealer. If he can't supply you, send us his name.

Ask for full information on our hardware specialty line that saves the Carpenter's time.

You will be particularly interested in our line of Wrought Steel Butts.

**Watrous-Acme Mfg. Co.**  
DES MOINES, IOWA

Chicago Sales Office: 180 North Dearborn Street



**Almetal**  
STORE FRONTS  
TRADE MARK

**Store Front  
Construc-  
tion**

The two-piece store front bar.  
Send for detail blue print.

**Detroit Show Case Company**  
481 West Fort Street Detroit, Michigan  
Makers of PETZ Metal Store Front (wood core)



**Will You  
Try Them**

## At Our Expense?

Bull Dog Sash Cord Fasteners will *save* from 3 to 6 feet of cord on a double-hung window and half the usual time it takes to attach cords to weight and fitting it into sash.

"Bull-Dogs" grip the cord and *never* let go; cost practically nothing.

**Free Sample Box**

Prove their economy and reliability by using them—entirely at our expense. Write us today for the box of "Bull-Dogs" as shown; won't cost you a cent.



Trade Mark  
Reg. U.S. Pat. Off.

**The Allen  
Company**  
197 Pearl Street  
Hartford, Conn.



Pat. Aug. 11-14

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### Miller's Bungalow Plans

are used exclusively in our book, "Bungalows and Other Things," which contains photographs and floor plans of many artistic homes that can be built for \$1,500.00 up. Get this book, it is the best of its kind on the market. Pick out the house you want and we will furnish the plans and specifications for \$5.00 to \$15.00. The book is receiving high praise from contractors and builders.

Price \$1.00

Burd F. Miller Co.

25 Brandeis, Omaha, Nebr.

to avoid mistakes and accidents. In laying out his work and checking up his levels the careful contractor uses an instrument similar to that made by the Warren Knight Co., 136 North 12th St., Philadelphia, Pa., and described in their 1915 catalog of the Sterling Convertible Level. The use of an instrument of this character will save time, prevent errors, and get the desired results quicker than by any other method.

### Harris Barn Equipment

From the large number of modern barns being erected throughout the country it is evident that the readers of the NATIONAL BUILDER are paying attention to modern barn construction and equipment. The advantages to be obtained through the use of the latest appliances are too obvious to discuss at this time, nor would it be possible to any more than indicate the advance which has taken place in this kind of construction in the last few years.

The latest catalog issued by the Harris Mfg. Co., Box 167, Salem, O., shows the complete line of equipment for Dairy Barns which this company make, as well as numerous farm implements and appliances. The catalog shows sanitary stalls and stanchions, litter and feed carriers, hay carriers, horse barn fittings, ventilators, spray pumps, etc.

With every catalog sent out by the Harris Mfg. Co., is included the outline of their plan for aiding contractors as well as farmers in planning, designing and equipping their barns and farm equipment. This co-operation is well worth considering.

## Diehl's Storm Sash and Screen Hangers



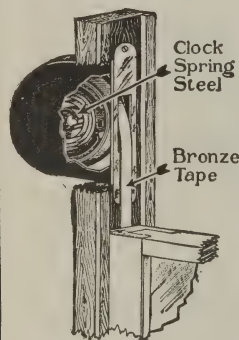
The only ball and socket hanger made; won't bind or blow off; can be hung one side at a time from interior or exterior of building. Cut shows style of hanger.

Write for complete catalog on Hangers, Hinges and other specialties.

Diehl Novelty Co.  
Glenbeulah, Wisconsin

No. 1

Price \$1.50  
Per Gross



--no weights--no cords

Balance your windows with

**PULLMAN**

**Unit Sash Balances**

instead of cords and weights. Work better, last longer, cost less; cannot get out of order; nothing to break. Clock springs instead of weights; metal tapes instead of cords; no noise; many have been in constant use for 25 years.

Uniform Face Plates so all mortises may be cut at the mill. Write for catalog and detail drawings.

**PULLMAN MFG. CO.**  
12 Industrial St., Rochester, N. Y.

## Books for Painters

By A. ASHMUN KELLY

Second Edition of the Expert Painter's Estimator and Business Book contains all that can be told about reading plans, measuring both from plans and from actual work, and estimating correctly. Painters need this book. Price, postpaid, \$1.50.

The Expert Calciminer, a text book and manual for decorators. All that the interior decorator or student needs to know about water colors for wall and ceiling decorations. Price, postpaid, \$1.00. Send all orders to

Hodgson Book Co., 537 So. Dearborn St., Chicago

## The Proper Treatment for Floors, Woodwork and Furniture

Laying a hardwood floor, putting up expensive trim or purchasing fine furniture, is really the simplest part of the problem. The proper finish and the proper care of floors, woodwork, furniture, etc., is really more important than the basic material itself or the form into which it is manufactured. The color value as well as the tone can be made or marred according to the quality of the materials used.

S. C. Johnson & Son, Racine, Wis., have prepared a beautiful booklet, NB 5, showing how, by the use of their materials the woodwork of a building can not only be given a beautiful finish but can be kept in

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Advertisers' Section

## "TO HUBERIZE IS TO ECONOMIZE"

### It's a Profit-Producing Plan

to buy *all* your building material direct from "Huber." Because—  
 You get **LOWER PRICES** (jobbers' and dealers' profits are eliminated);  
 You get **QUALITY GOODS** (that's the only kind we sell);  
 You get **LOW FREIGHT RATES** (our central location guarantees that).  
**Do your buying from our 32-page advertisement in the March issue of The National Builder.**

*In ordering state whether you are a contractor; it helps*

**The Huber Builders Material Company, 39-43 Vine Street, Cincinnati, Ohio**

## Yes, Mr. Contractor!

You can lay Wood-Mosaic floors of hardwood. Our  $\frac{5}{16}$ " flooring can be laid in old houses as well as new. We make all kinds and thicknesses; Wood-carpet, Strips, Plain and Ornamental Parquetry, Tongue-and-groove Flooring.

On receipt of accurate measurements of rooms, we will furnish colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for a free copy of our catalogue in natural wood colors.

**Wood-Mosaic Company**  
**33 Hebard St., Rochester, N. Y.**

Saw Mill and Flooring Factory: New Albany, Indiana  
 Sales Office and Parquetry Factory: Rochester, N. Y.



## How to Get the Parquetry Floor Jobs—

Everybody recognizes Parquetry as the most desirable floor!

The owner, of course, wants Parquetry that will give continuous satisfaction, and the price is an important consideration.

Impress on your customer that you use only the best Parquetry made—and that this Parquetry is yet the most moderately priced.

Lay **FEDERAL PARQUETRY**—a recognized standard. Finest White Oak, accurately milled, perfectly matched and absolutely uniform. Easy to lay, also.

We send directions with each shipment, with drawings to scale, where requested.

*Write for Special Circular No. 122*

**FEDERAL PARQUETRY MFG. CO., Inc.**  
 Offices, 175 5th Ave., New York Mills, Lexington, Kentucky  
 Agents wanted wherever we are not now represented

# OAK FLOORING

Highest grade of  $\frac{3}{8}$ " oak flooring in widths of  $1\frac{1}{4}$ ",  $1\frac{1}{2}$ " and 2". Plain or quartered. Made of carefully selected lumber. All of our oak flooring is end matched, thoroughly kiln dried and wire tied. Guaranteed in every particular.

We carry a large stock in all grades, and prompt shipment is assured.

*Perhaps we can save you some money. Tell us what you want.*

**PAUL O. MORATZ, First National Bank Bldg., Bloomington, Illinois**

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the same condition for any length of time. The booklet is beautifully illustrated in colors and is worthy of careful study.

### Lumber for Spring Building

This is the time of the year when everyone is getting good and busy and the far-sighted material man has his yards well stocked with high quality material for the discriminating contractor.

The Chicago Millwork Supply Co., 1423 West 37th St., Chicago, have been getting in shape for the spring business and they advise us that they never were in better shape to take care of orders from contractors who want and insist upon having the very best in lumber, millwork, and building materials in general. The 1915 catalog of the Chicago Millwork Supply Co. will show practically everything that enters into the construction of a new building or which will be used to improve an old one. Our readers who are contemplating either improvements or buildings should have this catalog that they may figure accurately and closely what the improvements will cost and so be able to close contracts which will be advantageous to them, while saving money for the owner.

### Sun Parlors

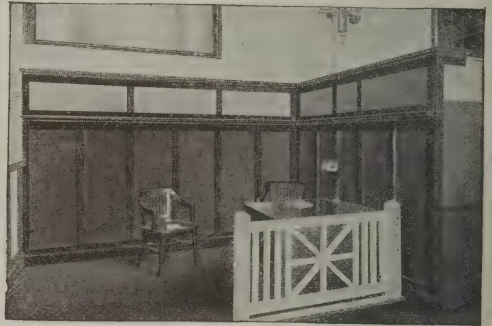
The growing tendency on the part of home owners to demand sleeping porches, balconies, sun parlors, etc., opens up an attractive field for the progressive contractor. That he may have something to work on, the Southern Cypress Mfg. Assn., 1212 Hibernia Bank Bldg., New Orleans, La., has prepared Volume 35 of their Cypress Pocket Library, showing not only excellent plans,

details, specifications, etc., for sun parlors, sleeping porches, balconies and similar construction, but also showing the advantage to be derived through the use of cypress for these features. The booklet is uniform with the other cypress booklets, except perhaps that there is a little more matter in it than in the volumes which have preceded it.

This excellent volume will be sent free to our readers on request to the above-mentioned company and we understand that they still have a limited supply of the back numbers on various other building subjects.

### Grained Wood Panels for Interior Decoration

The fact that modern buildings are beautifully finished is due to two causes. First, the demand for the finer finish, and



A Room Furnished with Fiberlic.

second, the enterprise of the manufacturers who have brought the cost of these furnishings to a reasonable price. The Fiberlic Co., Camden, N. J., have made an extensive study of interior finish and as a result have originated Fiberlic which closely imitates the grain of the most expensive woods.

Advertisers' Section.

## Be the "Steel Seating" Man in your locality--It Pays!



Here's a proposition for building contractors in every section of the country.

Our light, sanitary, non-breakable STEEL Seating is needed in Schools, Theatres, Churches, Moving Picture Houses, Lodge Halls, etc. Owners demand it.

You can get many of these profitable contracts by becoming our agent; we furnish you with free plans from your rough sketches, and help you in other ways.

Only one agent appointed in each locality; write us today for details.



**Steel Furniture Company, 1483 Buchanan Ave., Grand Rapids, Mich.**

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# A "Batch-A-Minute" Mixer That Mixes Like A Big Paver.

Has same mixing action as \$2000 pavers—batch stirred 60 times in 60 seconds. Steel construction—semi-steel gears. Mounted on steel trucks—3 h. p. engine—steel engine housing. Low barrow hopper. 5 ft.—Capacity up to 65 yards a day.

**\$185**

Ask about our Hand Power Mixer

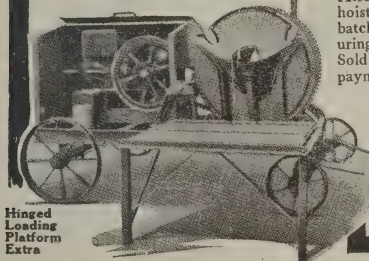
## Lowest Loading Mixer

Also furnished with hoist, power loader, batch hopper, measuring water tank. Sold on trial—cash or payments.

Write for catalog today

Contractor's Machinery Co.  
120 11th St.  
Keokuk - Iowa

**SPEED QUALITY**  
**Packard**  
HAND AND POWER MIXER

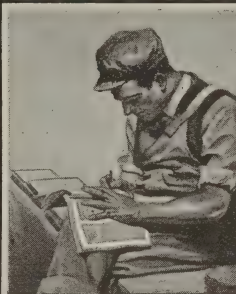


Hinged Loading Platform Extra

# The Man Who Wouldn't Stay Down



Now Architect



Carpenter

Hard work and low pay are for the man who *thinks* he "hasn't a chance." But the ambitious man trains himself for a better job—and gets it.

Only a few years ago this man was working 12 hours a day for seven days a week. But he marked just such a coupon as you see below. He studied at home. Promotion came. And now he is a successful Architect.

This man had no advantages that you don't have. But with the help of the I.C.S. he has "made good." *YOU can do the same.* If you can read and write the I.C.S. can help you to qualify for a better job.

Mark and mail the attached coupon. It won't obligate you in the least—and the I.C.S. will show you how you too can rise to a high-salaried position through their simple and easy system of home instruction.

## Mail the Coupon—NOW

**International Correspondence Schools**  
Box 1332-X, SCRANTON, PA.

Please explain, without further obligation on my part, how I can qualify for the position before which I have marked X.

Architecture  
Architectural Draftsman  
Contracting and Building  
Structural Engineer  
Structural Draftsman  
Concrete Construction  
Electrical Engineer  
Electric Lighting  
Plumbing & Steam Fitting  
Heating and Ventilation  
Plumbing Inspector  
Estimating Clerk

Mechanical Engineer  
Patternmaking  
Civil Engineer  
Surveying and Mapping  
Commercial Illustrating  
Mining Engineer  
Gas Engineer  
Automobile Running  
Bookkeeper  
Stenographer  
Civil Service Exams.  
Advertising Man

Name \_\_\_\_\_  
St. and No. \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_  
Present Occupation \_\_\_\_\_



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and



# YOU CAN HAVE IT

We want a name for this builders' hoist. Whoever sends in the best name will get one of these hoists **free**. Put on your "thinking cap" now. Winner will be announced in July.

This hoist will save nearly **one-third** of your brick-laying costs. Does away with hod and wheelbarrow expense. Elevates any material. Horse or engine driven.

Send for pictures and description, then tell us a good name; for our hoist. You can win one **FREE**.

**Attractive Territorial Proposition for Representative Supply Houses**



**H. B. Sackett Screen & Chute Co.** 1689 Elston Avenue  
CHICAGO, ILL.  
199 Medford Street, Charlestown, Mass.

PASTE THIS DOME  
WRITE TO ADVER.



ON LETTERS YOU  
TISERS. IT HELPS.



## The WEBER <sup>Double Acting</sup> Floor Scraper

### Try It For 5 Days at Our Expense

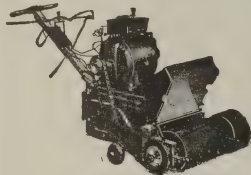
Scrapes 800 sq. ft. of floor per day easily—1200 feet if you "speed 'er up." Saves \$5 to \$8 a day over hand labor. Operates easily and cleanly. Prices \$15 and up.

Our agency proposition means easy money for you; write us about it.

**WEBER MFG. COMPANY**  
661 71st Ave., West Allis, Wis.



## The AUTOMATIC BALLBEARING ELECTRIC Floor Surfacing Machine



Patented Oct. 15, 1912.  
Made in several sizes.

will save you money by rapidly finishing your new or old floors just the way you want them. Self-propelling—you simply guide.

Write today for booklet telling all about the machine, our free trial offer and list of users near you.

**WAYVELL CHAPPELL & COMPANY**  
Phone Ravenswood 4143

Dept. C, 4845 E. Ravenswood Ave., Chicago, Illinois



## FREE TRIAL Rapid Floor Surfer

Made in Several Sizes

**M.L. Schlueter**  
225 W. Illinois St.  
CHICAGO



**\$15, \$25 and \$35**

Scrape your floors with Fox Machines. Scrapes any floor with even, uniform cut.

Six to nineteen knives attached. The right scraper at the right price. Write for catalogue.

**Fox Supply Co.**

Dept. N  
Brooklyn, Wis.

Sent on 10 Days' Free Trial

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This grain is not put on as a painted finish, but is a part of the actual material.

Fiberlic can be obtained in a variety of grains, among others, oak, walnut and mahogany. The use of Fiberlic is preferable to the actual wood in most cases, as the material is less subject to shrinkage, cracks, warping, swelling, etc. It is also much more easily applied. The Fiberlic Co. advise us that they have samples, specifications, and prices combined in a neat booklet which they are ready to send to our readers on request.

## Two New "Red Devil" Circular Glass Cutters

Since the advent of the automobile with its numerous and varied head-lamps of all sizes, the demand for circular glass lights for these has increased to a surprising degree.

For the enterprising and economical motorist who wishes to replace his broken lights himself, the Smith & Hemenway Co., Inc., 1546 Chambers St., New York, makers of the widely known "Red Devil" Glass



A Circle Glass Cutter.

Cutters and Electrical Hand Tools, have just brought out a most effective and handy circular glass cutter which will cut circles cleanly and neatly from 2" to 20" in diameter,—a larger size will cut up to 40". The illustration shown below will give a general idea of this practical little cutter. It is simple but very effective.

To meet the demand for a better tool of this class, Smith & Hemenway are offering a circular cutter, style 263, with hand honed wheels which will cut sharp, clean circles from 2" to 22" in diameter. This is a high class tool in every respect; the strong metal base around which the cutter revolves, is lined with rubber to prevent slipping—no unusual deftness is required to cut perfect circles with this tool.

It would seem to us that the automobile trade and hardware houses carrying automobile supplies, as also the glass houses,

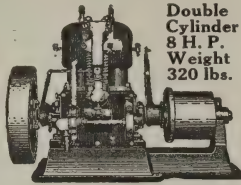
Advertisers' Section.

## Cushman Light Weight Engines

**R**UN steadily, quietly, and without trouble. Can be used in many ways heavy engines cannot. Weigh about one-fourth of other engines, yet more steady and reliable because of Throttle Governor and Perfect Balance. 4 H. P. 190 lbs.; 8 H. P. 320 lbs.; 20 H. P. 1200 lbs. Easy to move around. Schebler Carburetor. Friction Clutch Pulley.

Contractors and Builders requiring engine power will do well to investigate these light-weight, steady, high-powered 4-cycle engines. State power you need.

**Cushman Motor Works**  
913 No. 16th St., Lincoln, Neb.



**Double Cylinder  
8 H. P.  
Weight  
320 lbs.**

## AGENTS! \$45 to \$80 a Week



Thousands of dollars paid to agents already in the field: Rev. Otto Schulze, Missouri, got \$1700. Burkholder, Montana, orders \$1072 in 17 days. Well, of Missouri, made \$10 in one hour. Hamblinton, of Wyoming, made \$60 first two days. We want good agents in every county in the United States, Canada and Mexico.

**NEW INVENTION** Just out. Nothing like it. **FOLDING BATH TUB.** Gives to every home a complete bath room in any part of the house—without expense. Biggest, quickest, surest money maker of the century for agents. Territory being rapidly assigned. Send your application today.

**100% PROFIT** We back you with our capital and experience. We give you complete instructions, assistance and co-operation. No charge for territory. Don't delay. Send your name at once. Write plainly and give name of your county. Complete particulars FREE. Write today.

**ROBINSON MFG. CO., 1509 Factories Bldg., Toledo, Ohio**



## 132 Practical Building Plans

of comfortable, artistic, one and two story homes—with valuable suggestions on home planning and home building for... **\$1**

### STILLWELL CALIFORNIA HOMES

—have the latest built in effects and are the result of years of specialization. They are truly Californian, yet meet the requirements of any climate. Our books contain our most successful plans—a variety from which even "the hardest to please" will be able to select satisfactorily.

**"Representative California Homes"** All 3 books **\$1** Post Paid sent for

50 Ideal homes, \$1600 to \$6000—Price 50c

**"West Coast Bungalows"** We sell books and blue prints on a money back guarantee.

51 inexpensive homes, \$600 to \$2000—Price 50c

**"Little Bungalows"** 31 perfect little homes, \$300 to \$1700—Price 25c

**E. W. Stillwell & Co., Architects, 4385 Henne Bldg., Los Angeles**

## If You Want Convincing Proof That Hotchkiss Lock Metal Forms



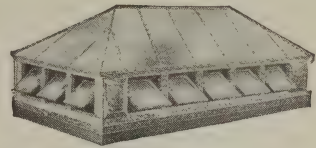
**for Sidewalks and Curbs**

are a profitable investment, write for our free demonstration proposition.

You can get into the concrete curb building business in your city and make good profits; you can lay your own sidewalks economically.

Let us tell you about these forms and others—look into this now!

**HOTCHKISS LOCK METAL FORM CO.**  
19 Jarvis Street - Binghamton, N. Y.



*—and ease  
of installation is  
another Willis feature*

A hammer and a screw driver are all that are needed to install Willis Skylights; no putty—no solder—no trouble.

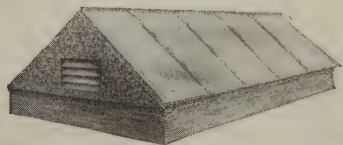
Shipped knocked down for convenience, safety and economy, and easily put together at the building.

## WILLIS SKYLIGHTS

have an unusually large glass area, yet are so well reinforced that we guarantee them not to sag or buckle. A **better** standard of quality in construction and operation, and low enough in cost to put a snug little profit in your jeans for every one you install.

Write today for the large Willis catalog on all kinds of Skylights, Ventilators and other sheet metal products.

**Willis Manufacturing Co.**  
Galesburg, Illinois



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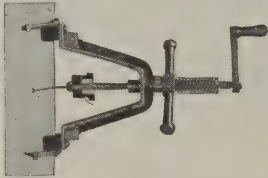
## Milwaukee Stay Wire Tightener and Fastener

For use instead of bolts and clamps. Fastens one stay wire a minute

Draws wire tight and firm. Enables stay wires to be tightened from the outside, and after the moulds are built.

No carpenter doing concrete form work should be without this tool. Price only \$20. Special discount for more than one. Write for circular

Milwaukee Device Co.  
1829 National Ave., Milwaukee



**Cordage  
Tackle Blocks  
Contractors'  
Supplies**



Tents

Waterproof Covers

Quick Service — Bottom Prices

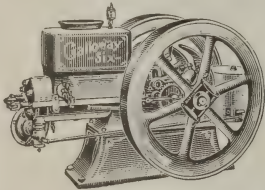
**GEO. B. CARPENTER & CO.**

202-208 Austin Avenue Chicago, Illinois

## Galloway "Six"

---the 4-in-1 engine

Use it for driving your Saw Rig — your Pump — your Concrete Mixer — your Hoist. Plenty of weight, plenty of strength, plenty of power. A real masterpiece in name and operation.



Backed by the Galloway reputation; guaranteed by the Galloway policy. Costs you only \$98.75 because we sell direct from factory to user. Order today — or send for catalog.

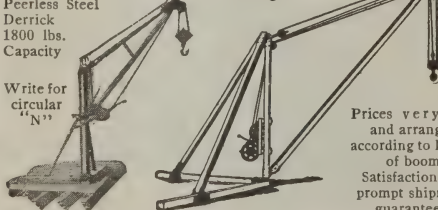
The Wm. Galloway Co.,  
2315 Galloway Station  
Waterloo - Iowa

## Introducing the New Sasgen 1 Ton Portable Stiff Legged Derrick

Built Strong and Light of all Crucible Steel

Peerless Steel  
Derrick  
1800 lbs.  
Capacity

Fittings



Write for  
circular  
"N"

Prices very low  
and arranged  
according to length  
of boom.  
Satisfaction and  
prompt shipment  
guaranteed.

Sasgen Derrick Co., 2053-57 N. Racine Ave., Chicago  
Canada Office: 1 Wabash Ave., Toronto

would find a ready outlet for a tool of this character.

Both cutters are supplied, of course, with the celebrated "Red Devil" cutting wheels, on the high qualities and wonderful cutting powers of which, the Smith & Hemenway Co. have largely based the business success which is theirs today.

## Applying Stucco by Machine

The widespread interest in stucco exteriors has been due to the real merit of this form of construction. The natural beauty of the materials as well as the artistic finish is ably supplemented by the permanency of the work when properly done.

Applying stucco by hand is a somewhat expensive process and is not always as satisfactory as could be wished. To overcome some of the difficulties the Automatic Stucco Machine Co., 51 East 42nd St., New York City, designed their stucco machine. This machine can be operated by one man and will apply cement plaster or stucco better and faster than can be accomplished in any other way under the additional assurance of obtaining a perfectly uniform coating.



Automatic Stucco Machine.

The automatic stucco machine is of special value for "over-coating" old frame houses as well as repairing stucco buildings which have been erected by other means. The Automatic Stucco Machine Co. have a special offer to readers of THE NATIONAL BUILDER and their literature will be of value and interest.

## A Test of Endurance

"The Standard" Low-Charging mixer has been very strongly guaranteed to the trade as a machine most able to withstand for years any hard usage to which it may be subjected.

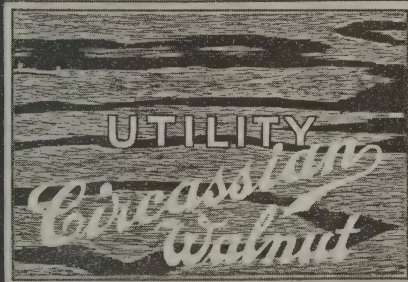
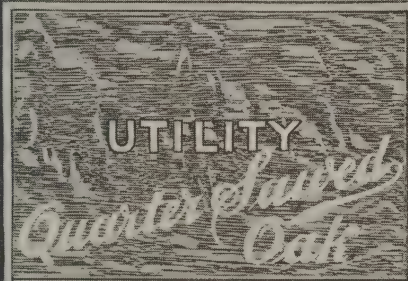
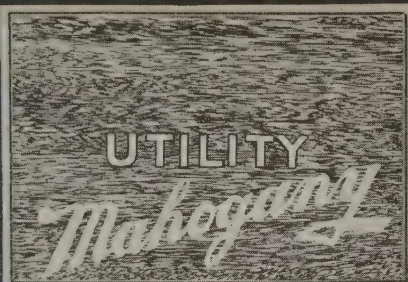
Four years ago this May the mixer, "The Standard" shown in the foreground

Advertisers' Section

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**Your Sample Panels of the new grained Utility Board are ready. Send for these today.**

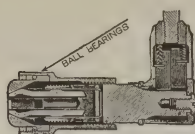
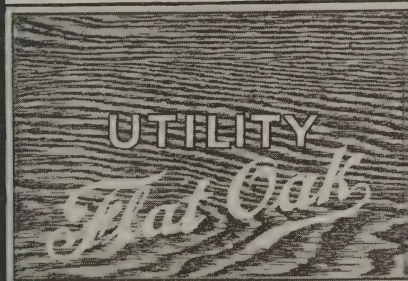
Grained, not stained—the samples will show you the difference.

Write for them now

### The Heppes Company

"Giant" Flex-A-Tile Shingles No-Tar Asphalt Paint  
Standard Flex-A-Tile Shingles Rubberite Roll Roofing  
Other guaranteed Heppes products

4502 Fillmore Street, Chicago, Illinois



## The Best BRACE Ever Made

If you want a brace that will give you absolute satisfaction, last a life time, and be the envy of all your fellow workers, ask your dealer for

## MILLERS FALLS BIT BRACE No. 872

The two forged steel jaws sit in an unbreakable socket made from bar steel. These jaws have four longitudinal millings which give a powerful grip for their whole length on any bit round or taper. Round shanks from  $\frac{1}{8}$  to  $\frac{1}{2}$  inches in diameter, No. 1 Morse taper, and all sizes of bit stock and expansion bit shanks may be accurately centered.

**Ball-bearing shell with case-hardened hood gives an extra grip**

Other important features are the ball-bearing, free-acting head and sweep handle, which greatly increases ease of action, and the patent cup washer, which holds the chuck to sweep without working loose. This Brace, though so superior to all others, costs very little more than the ordinary kind. Ask your dealer to show it to you.

**Another Millers Falls Tool you should have**

### The New Extension Bit Holder No. 6

Outer sleeve telescopes over inner spindle, and may be adjusted at intervals of one-and-a-half inches from 16  $\frac{1}{2}$  inches (length when collapsed) to 24 inches (total length). Chuck with grip like a vise will follow any bit of  $\frac{3}{8}$  inch or over.



Send for pocket catalog showing complete line

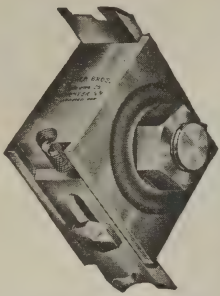
**Millers Falls Co.**  
Millers Falls, Mass.

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## CUTTER HEAD

Designed to meet the needs of the carpenter and builder who wants to make his saw table do more work. Any shape knives made to order. Runs like a solid cutter.

Catalog No. 34 sent on request

Huthier Bros. Saw Mfg. Co.  
1105 University Ave., Rochester, N. Y.

Patented December 30, 1913



## RELIABLE ERIE

The Biggest Labor Saver Built

A "Reliable" Hoist speeds up construction work; cuts

down costs. Made simple, works simple. Maximum lifting efficiency; minimum power costs. Single or double drum styles; several sizes. Our catalog shows the hoist exactly suited to your business.

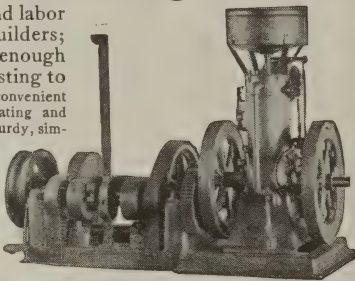
Prices are unusually interesting; write for complete information.

Erie Clutch & Pulley Co., 24th and Holland Streets, Erie, Penna.

## Ebel Hoisting Outfit

A big time and labor saver for builders; soon saves enough over hand hoisting to pay for itself. A convenient outfit for excavating and wrecking work. Sturdy, simple, big capacity, small price. Write for booklet.

Lansing Motor and Pump Co.  
Lansing - Mich.

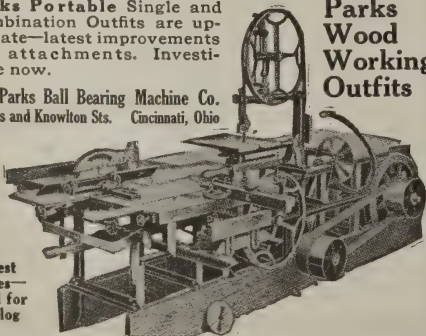


Parks Portable Single and Combination Outfits are up-to-date—latest improvements and attachments. Investigate now.

The Parks Ball Bearing Machine Co.  
Fergus and Knowlton Sts. Cincinnati, Ohio

Parks Wood Working Outfits

Lowest Prices—  
Send for Catalog



of the illustration was purchased by the New York City Dock Department from the New York Branch of The Standard Scale & Supply Company. It can be readily observed in what a good state of preservation it is after almost four years of severe usage. Appearing as it does "on the job" shows that it is capable of doing today what it did four years ago.

This manufacturer has continually maintained that the simplicity of "The Standard" produces its strength and endurance. The Low Charging arrangement of the drum of "The Standard" saves the wear and tear on this machine and thereby the life of the mixer is greatly prolonged.

"The Standard" Mixers are charged at the base of the drum instead of the top. It



A Standard Mixer on a Dock Job.

is proof that such an arrangement saves power, saves time, insures greater production per day and consequently proves a boon to a contractor's profits at the end of a year.

To attain strength, the first thought is bulk and weight. Instead, strength is developed through few parts in "The Standard." This means no complicated devices. The result is light weight.

The Standard Scale & Supply Co., having offices in Pittsburgh, New York, Philadelphia, Cleveland, Chicago and many other of the principal cities, are among the oldest concerns engaged in concrete mixer building. Thousands of their machines are in the field in operation. They have prepared their catalog No. 32-4 to be of

Advertisers' Section.

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# A Slateful of Crescent Facts

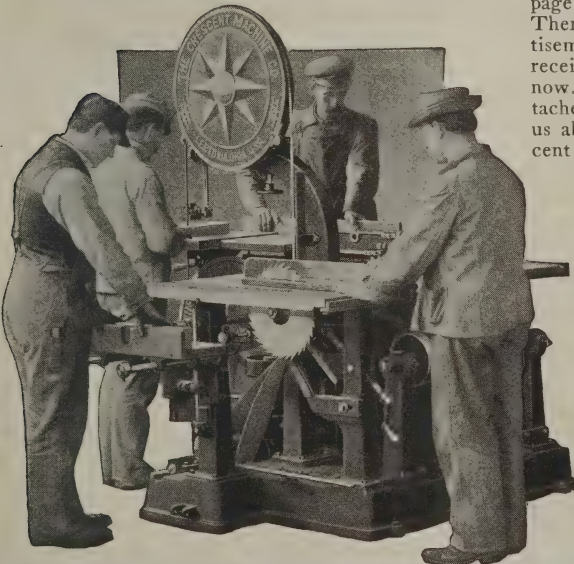
## —All Endorsed by Crescent Users

The slate tells the story; thousands of **Crescent Universal Woodworkers** in actual use *prove* it.

"Single machine; multiple service."  
"Complete woodworking equipment on one base."  
"A whole planing mill in itself."  
Whatever you call it — however you consider it — one fact sticks right out, and that fact is **ECONOMY**; first, last and *all* the time.

The longer you delay the more profits you sacrifice; we build "CRESCENTS" to satisfy the most exacting requirements in style, size and price.

## Refer to Our April Advertisement



The April National Builder contained a double-page insert on Crescent machines. There is an error in that advertisement. Tell us what it is and receive a souvenir. Refer to this now. You will find a post card attached which makes it easy to tell us about it and to ask for Crescent catalog.

## Woodworking Machinery for All Requirements

For the sake of economy, don't buy any kind of woodworking equipment until you investigate the Crescent line of Band Saws, Saw Tables, Planers, Jointers, Shapers, Surfacers, Borers, etc.

Our new 144-page catalog gives complete information on our entire line. Send for a copy.

**The Crescent Machine Co.**  
 10 Main Street Leetonia, Ohio

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ON LETTERS YOU  
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1911 2011  
DIETZGEN

## This Reads: 19 ft., 11 in.

You get the total measurement at one glance on Dietzgen Steel Measuring Tapes—the simplified reading saves time—delays—mistakes.

Black finish ribbon, etched divisions and numbers; superior accuracy. Write today for Catalog N.

**Eugene Dietzgen Co.**  
Manufacturers

Measuring Tapes Drawing Materials  
Surveying Instruments

Chicago New York San Francisco New Orleans Toronto Pittsburgh Philadelphia



special interest to our readers and the Chicago office 1345-47 Wabash Ave., is prepared to send it on request.

### A New Shingling Hatchet

Messrs. L. A. Sayre & Son, 340 Mulberry St., Newark, N. J., advise us that they are getting out a new Adze Eye Bell Poll Shingling Hatchet with a new type of raised gage which is adjustable by  $\frac{1}{4}$  inches from 4 to  $5\frac{1}{4}$  inches. This hatchet should appeal to those of our readers who are interested in shingling, as, being made especially for this purpose, it will allow the workman to cover a much larger surface with less effort and time.

Our readers can no doubt inspect one of these hatchets at their regular dealers, but in case that is not possible we understand that L. A. Sayre & Son have a circular showing the hatchet and giving prices, weights, etc.

### Methods and Materials in Waterproofing

It would be difficult to tell which is more important in any line of work, the materials used or the method of putting them in place. When it comes to waterproofing the subject is too important to trust to anything except the best known methods and materials.

The General Fireproofing Co., 610 Logan Ave., Youngstown, Ohio, have prepared a hand book on Waterproofing which will answer practically every question which comes up on this subject, whether in regard to materials, methods, quantities or costs, etc. While this hand book has been prepared at great expense it will mean the saving of many dollars to our readers. We understand that the General Fireproofing Co. will send the hand book free to those of our readers who mention THE NATIONAL BUILDER in writing for it.

### A Versatile Machine

The Parks Portable Combination Woodworker made by the Parks Ball Bearing Machine Co., Knowlton and Fergus Sts., Cincinnati, O., is designed to be a real helper about the job. It is so portable that it can be readily moved about the job where it can work to the best advantage, while the number of operations which can be per-

Advertisers' Section.

## Builders' Transit

No. 6187

An Ideal Instrument for Architect, Contractor, Builder. Constructed of the highest grade metals, with achromatic lenses, cross and stadia hairs, compass, full vertical circle. Guaranteed for accuracy, will positively hold adjustments.

A full line of levels, rods, tapes, etc., for Contractor or Engineer.

Large assortment of second-hand Instruments in good working order; good bargains.

Instrument repairing a specialty. Best workmanship—lowest prices. Send your instrument to us for an estimate.

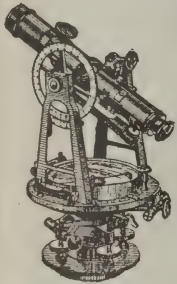
Catalogue 300 N. B. on Request

**F. WEBER & CO.**

St. Louis, Mo.

PHILADELPHIA

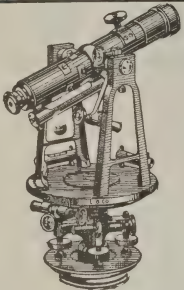
Baltimore, Md.



## Builder's Transit

For the builder or architect who wants to raise the standard of his work—who takes conspicuous pride in the accuracy of his efforts, this transit is especially designed. It is but one of the complete line of Beckmann quality instruments. Send for our complete free catalog.

**The L. Beckmann Co.**  
101 Adams St., Toledo, O.



## Stop Wasting Valuable Time

worrying along without an instrument or—worse yet—with one that is complicated, worn out or unreliable!

Be up-to-date! Safeguard your reputation and your profits by checking all lines and grades with a 1915 Model

“Sterling” Convertible Level

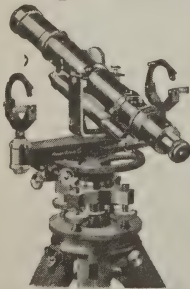
An examination of this splendid instrument will convince you that it is the most practical, serviceable and efficient level made!

Repairing a Specialty

Bargains in Second-Hand Instruments

**WARREN-KNIGHT CO.**

136 N. 12th St. Philadelphia



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# DRAW Perspectives YOURSELF of All the Buildings You Erect =

## Your Earning Power is Increased

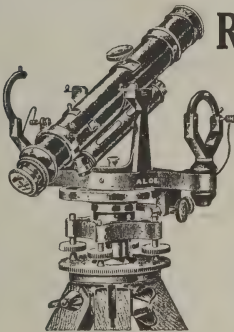
—if you have the ability to make your own perspectives. You save, not only the money that you at present pay out for perspectives, but also much valuable time. And you'll be able to give your customer, the building owner, more satisfaction.

Don't think you cannot learn how to draw—you *can*! You may not be able to draw *now*, but that is *not* lack of talent but lack of *training*. Our course brings out the latent talent that every average man possesses. We teach you *thoroughly*, and train you until your work is *perfect*. The cost of our course can be figured only as an *investment*.

As a *business*, this work offers excellent opportunities — men earn big salaries — and positions are always open.

Write today for large, illustrated prospectus.

**SCHOOL OF APPLIED ART**  
Dept. N. B. Battle Creek, Michigan



## Rent This Level 10 Months, Then It's Yours

**Builders — Contractors —** This is not the old style Architect's Level. It is the newest 1915 model **convertible** level. There is not a single Builder or Contractor who has not almost daily need for this instrument. For laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning shafting, walls, piers, etc., for getting angles, locating levels anywhere, ditching, laying streets and walks, running straight lines, and a hundred other uses.

### Instruction Book Free

Complete illustrated booklet telling how a builder or contractor can use the convertible level sent free on request.

### Send Coupon—No Obligation

Send the attached coupon today and we'll send illustrated booklet and complete details of how you can own the Aloë Convertible Level for 10 months' rent.

A. S. Aloë Co., 613 Olive St., St. Louis, Mo. →

### Warning

The Level we offer is the Aloë Convertible Level. Don't confuse the Convertible Level with the ordinary old style Architect's Level. The only work that can be satisfactorily done with the ordinary Architect's Level is the determining of elevations. But the Convertible Level, besides its use as a level, is a modified "Transit" and broadens the use of the level 100 per cent. You can't afford to buy any but the Aloë Convertible Level.

### Half Century Reputation

We have been manufacturers of transits and levels since 1863 and our instruments are the standard of the world.

### Free Trial

We allow you to convince yourself by a trial of the instrument before you obligate yourself.

### The Rent Buys It

No large cash outlay needed. Just pay the monthly rent for a few months and the instrument automatically becomes your property.

### COUPON

A. S. Aloë Co.  
613 Olive St., St. Louis, Mo.

Please send free instruction book on the use of the Convertible Level and complete details of your rental plan. This request in no way obligates me.

Name .....

Occupation .....

Street .....

City ..... State .....

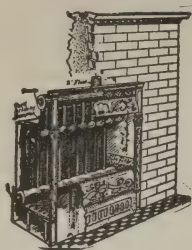
National Builder, May, 1915

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## Latest Designs In Hardwood and Tile Mantels

Our Patented Fire Place  
Heaters Heat One to  
Five Rooms

Write for Catalog, Stating Your Requirements

HEITLAND GRATE & MANTEL CO.

129 No. Fifth Street

Quincy, Illinois

## Saved by buying a \$50 BOVEE ECONOMY FURNACE \$50

At Manufacturer's Prices



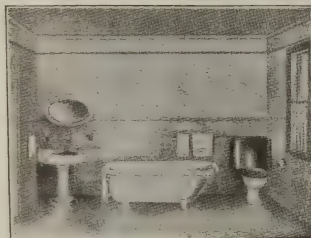
Has a large combustion chamber. Saves one third of the fuel. Has perfect

**Ventilating System**

**The Most Perfect  
Hot Air Plant Sold**

Send pencil sketch of floor plan for our manufacturer's price and illustrated catalog.

**Bovee Furnace Works**  
60 8th Street Waterloo, Iowa



## FULL LINE of PLUMBING and HEATING SUPPLIES

Sold Direct at  
Wholesale Prices

**20% to 40%  
Saving**

Complete bathroom  
outfits, tubs, closets,  
lavatories, kitchen

sinks, etc. Prompt shipment from a complete stock. The only house  
selling up-to-date, guaranteed goods at wholesale direct. **Write for  
illustrated catalogue and prices.**

**B. Y. Karol, 800-802 So. Kedzie Ave., Chicago, Ill.**

Let Us Give  
An Estimate

## Hot-Water Heating



For  
Old or  
New  
Houses

We take all  
risk and give  
360 days free  
trial. Guar-  
anteed by

bond. Liberal Profit to Contractors. Write today.  
**ANDREWS HEATING COMPANY**  
1469 Heating Bldg. Minneapolis, Minn.

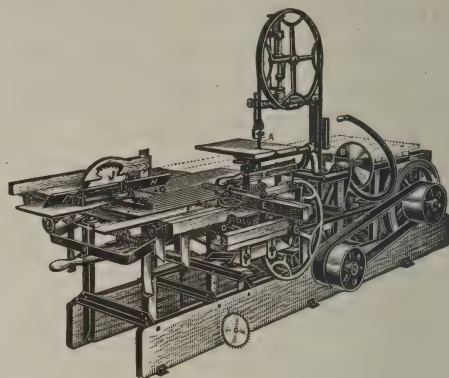
Steel Boilers  
Best Made



**BIG  
BOOK  
FREE**

formed upon it makes it a real time, money and labor saver.

While the cut will give one a general idea of this machine, the complete catalog is-



The Park's Combination Woodworker.

sued by the above company will make perfectly clear any of the details with regard to it which the contractor may desire.

## A Million Dollar Business

The Security Mfg. Co., Dept. 59, Toledo, Ohio, advise us that they have already sold over a million dollars' work of their Scientific Shoe Cleaner, which automatically removes mud, dirt and snow from the shoes in one operation. The shoe cleaner is adjustable, working as well on children's shoes as on adults.

An undesirable feature of most shoe cleaners has always been that the cleaner soon became so caked with mud and dirt that it was useless for the purpose for which it was intended. The Scientific Shoe Cleaner is so designed that it is readily cleaned and restored to its original condition.

The Security Mfg. Co. advise us that they would like to place a few more agents in various sections of the country and that those who have taken up this work have found it extremely satisfactory and profitable.

## Rapid Floor Scraping

The cut with this article shows Johnnie Powers of Hinckley, Ill., using a Fox No. 1 floor scraper on the floors of the recently erected residence of A. F. Leifheit. The use of this scraper has been found to be

Advertisers' Section.

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ON LETTERS YOU  
TISERS. IT HELPS.

# AJAX

Low Down Construction

# AJAX

WARM AIR

# FURNACES

**Sell From \$50 Up**

Through any dealer. If we have no AJAX dealer in your town we offer you a special discount.

Although it is low built (measuring 4' 9") for shallow cellars, it is excellent as well for high ones.

Excellent for Bungalows; has exceptional heating capacity, as it has 24 ft. of fire travel. Our literature tells all about why you should recommend and install the **Ajax**. If your dealer does not carry them, we will quote you a special discount. Investigate.



**Co-Operative Foundry Co.**  
P. O. Box 1029, Rochester, N. Y.

## More Money for Carpenters and Builders

taking orders for the modern necessity in rural homes, factories, hotels, churches, schools and summer camps—

## KAUSTINE Sewage Disposal System



Does away with the disease-breeding outhouse and cesspool. Odorless and absolutely sanitary.

**No Water---Sewer---Plumbing!**

Kaustine Chemical kills odors and germs—prevents typhoid and other diseases. Endorsed by health authorities.

A permanent, practical installation. Gives all advantages of plumbing and city conveniences with no bother—and at a fraction of a cent a day to operate.

You can make the plumber's profit—quick money—steady income, and install them yourself in a few hours. It will pay you to be the first Kaustine man in your locality—don't wait—write today for full details—a postal will do.

**KAUSTINE CO., Dept. 1094, Buffalo, N. Y.**



NAIL HERE

## Here's the Latest

Edwards "Ohio" Metal Shingle is the latest and best metal shingle product on the market today—barring none. The "Ohio" has a handsome novel design. The clean cut embossing can't be beat.

## Edwards "Ohio" Metal Shingle

The beautiful pattern is made in one size only—14x20 inches. Manufactured from the best quality Worcester Grade Terne Plate, painted or "Tightcote" galvanized.

The "Ohio" has the patent interlocking device and every other good feature that has made Edwards Shingles famous.

### Shall We Send Samples and Prices?

## The Edwards Mfg. Co.

*"The Sheet Metal Folks"*

**430-450 Eggleston Ave., Cincinnati, O.**

**Largest Manufacturers of Metal Ceilings, Metal Shingles, Steel Roofing and Siding in the World**





## The "BEST" Fuel Chute

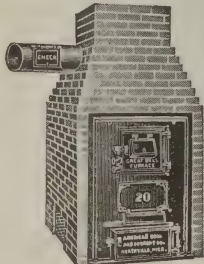
The "BEST" Coal Chute is also a window, and can be made into a ventilator if desired. A heavy screen protects the glass when chute is open. Chute cannot be opened from outside. Also made with solid cast door. Three sizes. Easily installed in new and old buildings. Our new catalog illustrating and describing

protects the glass when chute is open. Chute cannot be opened from outside. Also made with solid cast door. Three sizes. Easily installed in new and old buildings. Our new catalog illustrating and describing

### THE BEST LINE—BUILDING HARDWARE

is just off the press and is of interest to every live Contractor and Builder. Our line includes Coal Chutes, Chimney Caps, Revolving Tops and Copings, Cleanout Doors, Cistern Covers, Stud Sockets, Foot Scrapers, Cesspools, Hog Waterers. Write us for the new catalog. Please give us your dealer's name.

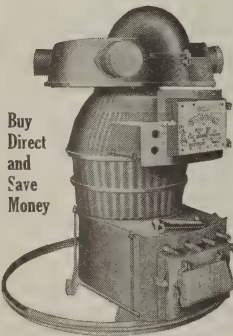
Sterling Foundry Co., 800 Wallace St., Sterling, Illinois



## A Hot Air Furnace

you ought to know about. Costs no more than a base burner, heats twice as much on about the same amount of fuel. No pipes, no lost heat. Brick or portable. Write and learn.

American Bell & Foundry Co.  
Northville, Michigan



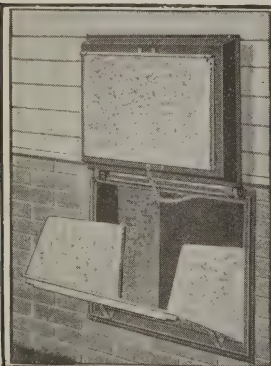
Buy  
Direct  
and  
Save  
Money

## GIBSON FURNACES

Burn smoke and gases—cut down ordinary fuel costs one half; the special construction of the combustion chamber is the reason why.

Install Gibson Furnaces in your customers' homes—satisfaction for them, profit for yourself. We sell direct to contractors. Get literature, prices and trade discounts by writing us today.

Gibson Mfg. Co.,  
415 Miles St., Waterloo, Ia.

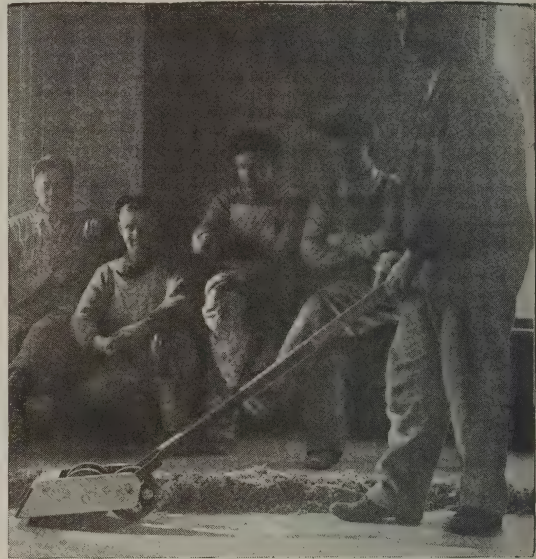


## "JULIEN" Coal Chute

A perfect coal chute and an attractive looking basement window. Lets light in; keeps burglars out. Locks automatically from the outside; opens only from the inside. When in use the door protects the building, and a steel shield protects the glass. Write for circular, prices and discounts.

Loetscher-Ryan Mfg. Co.  
Main St., Dubuque, Iowa

extremely economical in time and labor, scraping a floor about four and one-half times as fast as could be done by hand and at the same time giving a much better finish. Dept. "N" of the Fox Supply Co., Brooklyn, Wis., advise us that this floor is



Scraping a Ball Room Floor.

one of the finest dancing floors in the State of Illinois, and that their general catalog will be sent to our readers on request. It gives a great deal of practical information on floor scraping and finishing.

### A Unique Demonstration

The great variety of machines, appliances, tools, etc., on the market for practically every purpose leads many contractors to be careful what they buy as any additional equipment, unless it is of real service, would merely take up valuable space in their shops. The Hotchkiss Lock Metal Form Co., 19 Jarvis St., Binghamton, N. Y., have devised a method of showing contractors exactly what their forms are like at practically no expense to the contractor. This method consists in sending to the contractor a set of miniature forms, complete in every detail, of their forms for concrete curbing, sidewalks, road edging, gutters, etc. These miniature forms are practical working models which the contractor can fill with concrete if de-

Advertisers' Section.

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ON LETTERS YOU  
TISERS. IT HELPS.





## Wheeler Safety Scaffold Brackets

In Position

Fold Compactly

**Save Lumber-Save Labor-Save Nails-Save Accidents**

Pay for themselves on two jobs. Last a lifetime. Lock automatically. Are rigid and firm when in place. Scaffold cannot swing. Men cannot be careless putting them up. Write for our **Free Trial Offer**. American Steel Scaffold Co., Dept. 4, Detroit, Michigan



## Hudson Asphalt Shingles

**Red or Green**

—make durable, attractive and economical roofs for all kinds of buildings where shingles can be used. Positively will not crack or break, resist fire, require no painting. Colors are non-fading. Write today for samples and literature.

**Asphalt Ready Roofing Company**  
9 Church Street - - New York, N. Y.

## ROOFING SLATE

OF QUALITY

MINERS

MANUFACTURERS

**The AULD & CONGER Co.**  
DEPT D

ESTABLISHED

1870

CLEVELAND OHIO



**Everything in GUARANTEED PLUMBING and HEATING SUPPLIES at WHOLESALE**

Bathroom Outfits, Sinks, Pipe, Fittings, Valves, Faucets, Heating Boilers, Radiators, Water Pressure Systems and Lighting Plants for Country Homes, etc. Our \$200,000.00 plant behind our GUARANTEE. Send for complete Catalog No. 31.

**JONH HARDIN CO.**

35 Years at 47th and Cottage Grove Ave. Chicago, Illinois

## WAGNER

**Ever-Tight**

**TROLLEY TRACK**

**New—Different—Better**

No brackets—track is forced up tight to building by lag screws. Rain or snow can't drive in between track and building. Completely protects hangers and top of door. Nothing else like it on the market—nothing so near to trolley track perfection. Absolutely bird-proof. Impossible for door to come off.

**Ask Your Dealer**

for Wagner Door Hangers and Tracks and Studding Sockets for cement floors. Write for illustrated circular.

**Wagner Manufacturing Co., Dept. E, Cedar Falls, Iowa**

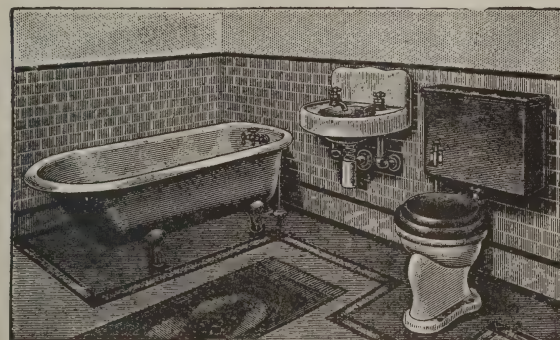
## GAS PLANTS for COUNTRY HOMES

EVERY suburban and country home, large and small, can have gas for lighting and cooking.

### MILBURN PLANTS

make gas which is better than city gas and costs no more. Machines are simple, automatic and durable. Write for Catalogue V-22.

**The Alexander Milburn Co.**  
Baltimore - Maryland



## Write for Kulp's Free Catalog on Plumbing and Heating Outfits...

Quality and low wholesale prices will please you

This handsome three-piece outfit—as shown—at the very low price of \$31.28.

Our catalog gives full description of this and many other big bargains. Get our catalog now.

**CHAS. P. KULP & CO.,**  
1611 So. State St., Chicago, Ill.

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ON LETTERS YOU  
TISERS. IT HELPS.





## Special Offer

You have experimented with many water-proofing compounds containing "Steatites" or other soaps. IMPERVITE is not a soap; it is the only compound which is an "Asphaltic Emulsion."

It has been used for many years on the most difficult works.

Let us prove that one pound of Impervite is better than two pounds of Soap Compound.

We can send you Official Government Tests and scores of enthusiastic letters from Users—but will this satisfy you?

In order to give you an opportunity to PROVE our claims, we are willing to send you 25 pounds of Impervite for \$2.00 (freight prepaid by us) with the understanding that if it does not prove more efficient than the compound you are now using, you will be under no obligation to pay us. We are willing to let YOU be the Judge.

Write today, on your letter head, and shipment will follow at once. WHY NOT GET THE BEST?

**The Standard Paint Co.**  
NEW YORK BOSTON CHICAGO

sired and so get a real working demonstration of the forms. The models will be sent to any of our readers for a very limited charge which will be refunded in case a working set of forms is purchased or the amount will be refunded if the models are returned. More particulars of this offer of the Hotchkiss Lock Metal Form Co. can be obtained from them direct at the above address.



## Thurman Vacuum Cleaners

*Stationary and Portable*

**For Residences, Hotels, Office Buildings, Etc.**

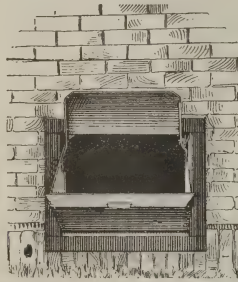
70 Different Types and Sizes

Residential (built in the house) Stationary Plants from \$150.00 up. Our Engineering Department is at your disposal to lay out your pipe line gratis. *Write for free booklet.*

**Thurman Vacuum Cleaner Company**  
(Originators Vacuum Cleaning Machinery)  
Dept. F. Eleventh & Monroe Sts., St. Louis, Mo.

### The Milwaukee Stay Wire Tightener and Fastener

The concrete worker realizes the necessity of having all of his forms absolutely tight and yet realizes the amount of work necessary to do this by ordinary methods. The Milwaukee Stay Wire Tightener and Fastener, made by the Milwaukee Device Company, 1829 National Ave., Milwaukee,



## Kewanee All-Steel Coal Chutes

**Pay Profits**

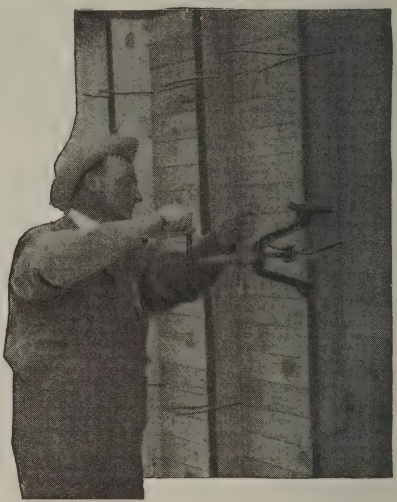
You, Mr. Contractor, can get this PROFIT, by installing Kewanee Chutes in your buildings.

Built entirely of steel—no cast iron nor glass to break or get out of order.

Automatic in action and easily installed in any building old or new.

**Write for Special Proposition to Contractors**

**Kewanee Manufacturing Co.**  
Kewanee - Illinois



Fastening Wires the Modern Way.



## The Enterprise Coal and Fuel Shute

**The Easiest Installed**

Non-Breakable—and Cheapest and Simplest Fuel Shute made. Cheapest because simplest.

Only four pieces—Frame, Spout, Lock and Weight.

Roller bearing hinges; no exposed bolts to tamper with.

Positively no way to open it from the outside. All of cast iron—practically rustless.

Sent to any address on receipt of \$7.50. Write for Builders' and Dealers' Discount

**Enterprise Iron Works**  
Albert Lea, Minnesota

Wis., is designed to tighten the wires used for holding forms together, and, as may be inferred by the photograph herewith, they do this with a fraction of the labor required to fasten them by hand, and at the same time they draw the wires much tighter together.

The Milwaukee Device Company have an interesting circular on this tightener and fastener showing the many places where the device can be used and indicating its value for a great variety of purposes.

Advertisers' Section.

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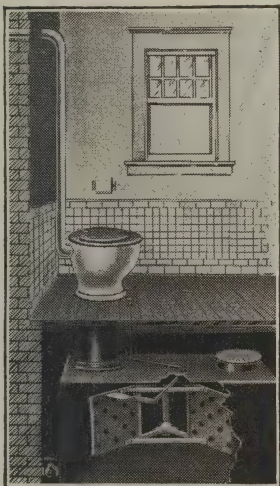
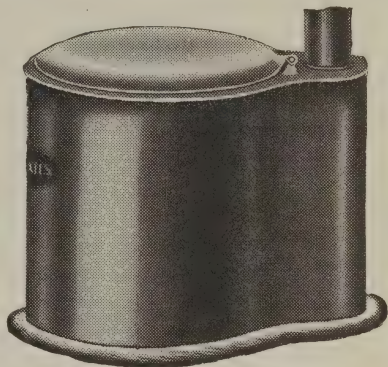


ON LETTERS YOU  
TISERS. IT HELPS.

# Wolverine Indoor Closet

Within the reach of every home. No Water. No Septic Tank. No expensive plumbing. Can be installed for half the cost of water systems. Guaranteed to be absolutely

sanitary and odorless. Chemical used in vault; 18 times stronger than carbolic acid; completely liquifies everything that enters tank. Greatest invention of the age for carpenters and builders in rural or suburban sections. Can be placed in every farm home; biggest thing out for summer cottages. Here is the opportunity of your life.



*Write Us Quick for Agency in Your County*

**DAIL STEEL PRODUCTS CO.**  
835 East Main St., Lansing, Michigan



PATENT APPLIED FOR

## Sewage Disposal

---a profit-paying proposition for builders and contractors

¶ Are you posted on modern sewage disposal methods? If not, you ought to be! ¶ In buildings not connected with city mains the sewage disposal question is a serious one. ¶ Cesspools are neither practical, safe nor sanitary; neither are privy vaults. ¶ The modern, scientific, economical and sanitary method is the

## ATEN SYSTEM

by which all sewage is disposed of quickly and inoffensively, and with practically no attention. ¶ The ATEN System can be readily installed by yourself without trouble or heavy expense. ¶ Write for complete information, prices and trade discounts.

**Theodore Aten**

Wills Bldg., 5th Avenue and 30th Street  
New York City

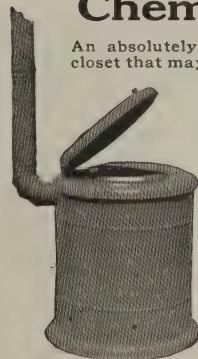


## Carpenters—

**You can Save Money on Every Spring Job**

Here's something right in your line—a Chemical Closet that you can sell to a home builder cheaper than a wooden privy and make a bigger profit for yourself. Here's something you can sell at odd times or turn over to your son or your foreman to sell.

## RO-SAN Chemical Closet



An absolutely sanitary, odorless indoor closet that may be placed anywhere in the house. Abolishes the germ-breeding outdoor vault. A comfort and a convenience where there is no sewer connection. Germs killed by chemical. Easily emptied as the ash pit of a stove.

### Agents Wanted

We want one live carpenter contractor in each town to act as our agent. Good profits for little work. **We help you sell them.** Write today for complete details.

**Rowe Sanitary Mfg. Co.**  
203-A 6th St., Detroit, Mich.

Ask about the Ro-San Washstand. Hot and cold running water without plumbing.

PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



### Why "Bull Dogs" Save

The "Bull Dog" Sash Cord Fastener shows a decided saving for the carpenter or builder in the amount of cord used, it frequently happening that a carpenter will cut off from 15 to 20 inches of cord more than is required to hang the sash. This is done through the inability to tie a knot directly on the end of a string, as well as the extra amount which is required to form the knot.

"Bull Dog" Sash Cord Fasteners are of value also from the fact that they can be applied in a fraction of the time necessary to tie the ordinary knots for either the sash or the weight. Moreover the grip which the fastener gets on the cord prevents its ever becoming loose or pulling out.

The manufacturers of the "Bull Dog" Sash Cord Fasteners, the Allen-Sponsel Co., 197 Pearl St., Hartford, Conn., have prepared boxes containing enough fasteners to do an entire window. These are specially prepared for our readers who should write to the Allen-Sponsel Co. for the box which is waiting for them.

### The Protection and Decoration of Cement Construction

The actual construction of a building is only half of the problem which confronts



Protected with Bay-State Cement Coating.

the contractor. Every part must be built for permanence, not only of the actual building but of the appearance as well.

Concrete buildings, that is buildings in which Portland Cement is used for the exterior, such as stucco, reinforced concrete, blocks, etc., are more or less subject to change in their external appearance, due to the action of the weather upon the concrete surfaces. To provide against such changes, Messrs. Wadsworth, Howland & Co., Boston, Mass., have prepared brick and cement catalogs for the use in these places. The cut herewith shows one of the buildings on which their Bay State Brick and Cement Coating was used. Booklet No. 15, issued by the above company, will give the reader any desired information regarding the application of these coatings, the results obtained, costs, etc.

### Winner Mixers

Every contractor wants to know how he can save money and the Cement Tile Machinery Co., 511 Rath St., Waterloo, Iowa, show in their catalog how twenty-five to one hundred dollars can be saved.

Of the many machines made by the Cement Tile Mch. Co., the "Winner" concrete mixer is an established favorite. The "Winner" is made in a number of styles, each style being also made in a number of sizes. This will allow the contractor to get either a large or small machine and so be prepared to do any class of work.

The general catalog of the Cement Tile Machinery Co. lists practically every machine which the contractor doing concrete work is apt to use. It includes cement tile machines, block machines, elevators, mixers, conveyors, screens, wheel-barrows, tools, etc., and will be sent free to those of our readers who are interested in this class of work.

### An Arkansas Miracle

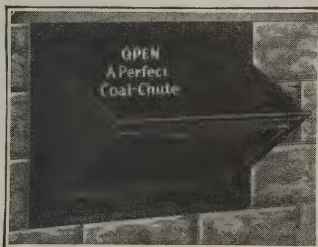
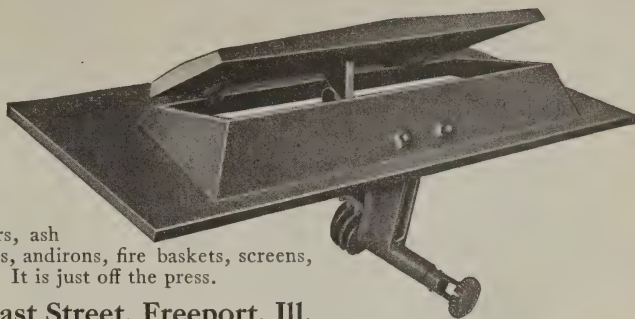
A. J. Webb, you know, is one of our best carpenters. Several years ago he built his first house. Now this building was a two-story structure, put up mostly of white pine. The first night after the house was finished, a strange thing happened. Along about 12 o'clock this house, which was built of pine, turned to stone. You see, there came up an awful wind storm and made the house rock.—Liberty Correspondent of the Rogers, (Ark.) Democrat.

## Fireplace Equipment

This Fireplace Damper is very easy to erect, low in price, and will give the best of service. The operating lever extends under the brick or tile.

Send for our catalog showing dampers, ash trap doors, clean out doors, thresholds, andirons, fire baskets, screens, spark guards, gas logs, fire sets, etc. It is just off the press.

STOVER MFG. CO., 35 East Street, Freeport, Ill.

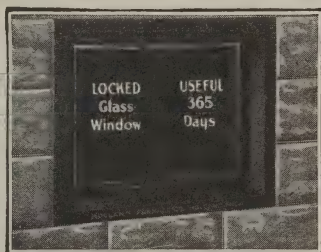


If You  
Build,  
Buy,  
Own

Be up-to-date  
and have the  
world's best—

The Window Chute for your coal bin.

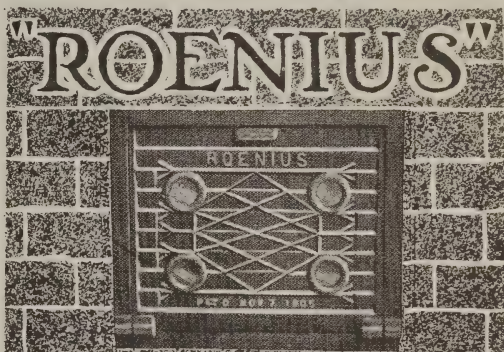
Thousands  
in use—  
The very  
Best.



Write for Booklet "C."

Holland Furnace Co., Holland, Mich.

World's Largest Direct Installers of Furnaces.



## Coal and Wood Chutes for Severe Service

Roenius Chutes are *serviceable*--made of cast iron and will stand abuse.

They are *convenient*--four unbreakable bulls-eye discs flood the coal bin with light.

They are *safe*--cannot be opened from the outside, yet easily opened from inside.

They are *neat*--do away with the dilapidated appearance common to ordinary basement windows.

They are *economical*--the first cost is the last. Made in several styles; many sizes. Get circular and prices.

Grand Rapids Foundry Co., Grand Rapids, Wisc.

## What About Heat?

Your customers want **good** heat—lots of it—at a low fuel cost. They want a furnace that works without trouble—in the coldest weather—that is reasonable in first cost—that has years of experience behind it.

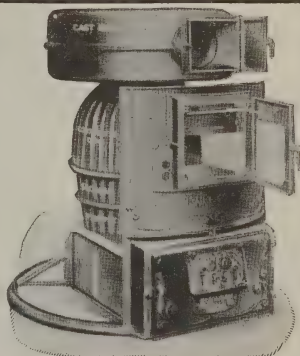
One furnace will answer these requirements—and it's called the **GEM**. For business sake **recommend** it.

### Co-Operate With Our Dealer

The **GEM** is built for efficiency-first, but is economical just the same. It's the furnace that will satisfy the most exacting requirements.

Write for the catalog today, and learn how we can benefit your furnace business through liberal co-operation. Don't forget—write us **now**.

Robinson Furnace Co., 205-7 W. Lake St., Chicago



PASTE THIS DOME  
WRITE TO ADVER-



ON LETTERS YOU  
TISERS. IT HELPS.



From  
living  
room



Here is just that touch of up-to-dateness needed to make your houses easier to rent and sell.

A ready-to-install outfit of

## Western Electric Inter-phones

containing two hand set type intercommunicating telephones will save stair-climbing and calling from floor to floor.

Send \$15 by cheque or money order to Dept. 25-BL. An outfit will be sent by parcel post.

## Western Electric Company

Manufacturers of the 8,000,000 "Bell" Telephones

New York	Atlanta	Chicago	Kansas City	San Francisco
Buffalo	Richmond	Milwaukee	Omaha	Oakland
Philadelphia	Savannah	Indianapolis	Oklahoma City	Los Angeles
Boston	New Orleans	Cleveland	Minneapolis	Seattle
Pittsburgh	Houston	Cincinnati	St. Paul	Portland
St. Louis	Dallas	Denver	Salt Lake City	

EQUIPMENT FOR EVERY ELECTRICAL NEED  
Member Society for Electrical Development. "Do it Electrically"



To  
kitchen

THE PERRY LUMBER RECKONER						2-4 1-8
2-18 1/4 = 1/4 Equals 1/4 Feet to the Lineal Feet.						2-6 1-4 1-12
Pcs	FEET	Pcs	FEET	Pcs	FEET	2-8 4-4 1-16
1	0 3/4	34	317 1/4	67	625 1/4	2-10 4-5 1-5/8
2	1 1/4	35	330 1/4	68	634 1/4	2-11 4-6 1-3/4
3	2 1/4	36	343 1/4	69	643 1/4	2-12 4-7 1-15/8
4	3 1/4	37	356 1/4	70	652 1/4	2-13 4-8 1-11/8
5	4 1/4	38	369 1/4	71	661 1/4	2-14 4-9 1-13/8
6	5 1/4	39	382 1/4	72	670 1/4	2-15 4-10 1-11/4
7	6 1/4	40	395 1/4	73	679 1/4	2-16 4-11 1-15/4
8	7 1/4	41	408 1/4	74	688 1/4	
9	8 1/4	42	421 1/4	75	697 1/4	
10	9 1/4	43	434 1/4	76	706 1/4	
11	10 1/4					
12	11 1/4					
13						

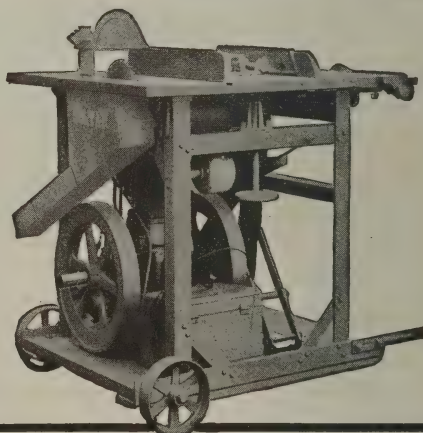
## A Necessity for Lumber Users

The Perry Lumber Reckoner makes figuring easy. Tells the number of feet in any number of pieces—note cut of sample page at top. Gives *exact* number quicker than you could *guess* at it. Keeps you from making costly mistakes in your estimates; saves time and labor. Covers all the different sizes of lumber, and is so indexed that you can turn to the right page instantly.

Book is bound in cloth; seventh edition; fits the pocket. Thousands in use. Sent to any address, prepaid, for \$1.50. Write for one; money refunded if you ask.

Benj. L. Jenks  
1201 Marshall Bldg.  
Cleveland Ohio

\$1.50



## "SULTAN" WOODWORKER Portable

Buying gasoline for this Sultan Outfit is cheaper than paying wages to six hand-saw carpenters—\$20 a day cheaper. That's what the Sultan will save you—in money. What it saves in time is extra.

The Sultan will do Ripping, Jointing, Boring, Rabbiting, Shaping, Tenoning, Sanding and other work. Has all the adaptability of larger machines, at a fraction of their cost. The famous 5 h. p. Sultan engine gives the most efficient power possible. See our advertisement in March National Builder.

Write today for descriptions on this Rig, also on Hoists, Pumps, etc.

Whitman A. Co., 7005 S. Broadway, St. Louis, Mo.

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ON LETTERS YOU  
TISERS. IT HELPS.

# When You Want — Tiles and Mosaics

## Write

For Bathrooms, Kitchens, Hallways, Drug Stores, Ice Cream Parlors, Banks, Buffets, Walls, Wainscoting, Store Entrances.

We carry a most complete line of Ceramic Mosaic Floor Tile and Sanitary Glazed Wall Tile for every purpose. Our designs are unusually artistic and correctly executed. The quality is *Lorenzen*—the best guarantee a builder can get. You can depend upon our prices being right.

Let us estimate on your next job or furnish you with an original design. At any rate, write for our Catalog No. 51 on Tiles and Mosaics. A postal will bring it and it is invaluable for your files. Our large booklet, "*Vogue in Fire Places*," the most comprehensive and complete catalog ever issued on fireplaces should also be in your files. Write for it.

Send for our discount proposition to carpenters and builders.

**Chas. F. Lorenzen & Co.**  
101 Washington Street Chicago, Ill.

## Artistic Designs and Superior Quality

# Get the Composition Floor Business of Your Town



**Big profits for your fall and winter months**  
**Investigate now!**

## Santilite Sanitary Composition Flooring

It is laid in a plastic state on any old or new wood or cement floor. Sets in 8 to 10 hours into a continuous, smooth, jointless surface that is fine grained, sanitary, fire-proof, water-proof, germ-proof and wear-proof floor.

"**SANTILITE**" is easy to keep clean—does not have to be scrubbed—almost noiseless—absolutely no dust from abrasion—resilient—not slippery—has an excellent appearance—will not crack under ordinary settlements and is not expensive.

"**SANTILITE**" is especially adaptable for kitchens, refrigerator rooms, pantries, laundries, bath rooms and lavatories in residences. For old or new floor construction in offices and stores and will replace dusty, dilapidated floors without shutting down the plant in factories.

We sell you the material and give very full and complete instructions for laying floors. Colors, light red, light gray, dark gray, buff and green. *You lay the floor. Easy work and big profits.* We offer special discounts only to contractors and building supply dealers. Write us at once for our proposition and prices and keep busy during the winter months.

**SANITARY COMPOSITION FLOOR CO.**  
**340 West Fayette St. Syracuse, New York**

No raise in price on account of increased cost of materials due to the European War



After Remodeling

# New Beauty for Old Time Buildings

The plain square lines of this old time house have been relieved and the whole building made to look new by using

## UNION METAL COLUMNS

"The Ones that Last a Lifetime"

Every builder knows of many cases like this where a little remodeling and the addition of an artistic feature like the column would double the value of property.

Union Metal Columns offer you a splendid opportunity to go after such work. They are correct in design, practically everlasting and so low in cost that they can be used on the most inexpensive job.

These columns are made of open hearth steel specially galvanized, then fluted and tapered by patented machinery. They have the required entasis and stopped flutes. Ten designs and all sizes.

Send for handsome book showing buildings where they have been used.

Complete catalog in Sweet's

**The Union Metal Mfg. Co.**  
**CANTON, OHIO**



Before Remodeling

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ON LETTERS YOU  
TISERS. IT HELPS.



### Aluminum Levels

Every carpenter remembers getting into difficulties through his level getting a little out of true. With the old-fashioned levels it was necessary to dig out the glass and set the bulb over again as well as dress down the wood in order to insure accuracy.

The introduction of Sand's Aluminum Levels, made by J. Sand & Son, 1023 Rivard St., Detroit, Mich., is therefore a boon to the contractor as it reduces the liability of error through the level going wrong. The Sand Aluminum Level is so made that it needs no adjusting and there is nothing to work loose or get out of order. A catalog of the complete Sand's Line shows the various styles and sizes made and it even shows the 24 inch aluminum level full size in actual colors. This catalog will be sent to our

readers on request and it will enable them to see exactly what they want in the way



Every Level on the Job is a Sands Aluminum.

of levels and if they cannot obtain what they want from their local dealer they can order direct.

### Locking the Barn Door

It is very easy in any line to stop just short of perfection. Whether it is in construction or anything else it is a universal failing to think that almost anything is good enough.

It is sometimes thought that any old kind of a lock or latch will do for the barn door. That there are better means is indicated by the circular showing the Whitcomb Steel Barn Door Latch made by the Albany Hardware Mfg. Co., Albany, Wis. This circular shows a strong, durable latch, adjustable to any thickness of door, and designed to open from either side. Being made of steel it is practically unbreakable. The latch is divided with two catches so that it can be held either closed or open. The advantage of this will be seen when one wants the door open for ventilation or, when a Dutch door is used, to open only the upper half.

### Architectural Ornaments

The great variety of styles and details of ornamentation render it possible for the architect, the contractor and the owner to select the very style suited for the particular buildings which they have in mind. The

system of the Architectural Supply Co., 420 High St., Ft. Wayne, Ind., enables the architect, the contractor, the builder or the owner to decorate their buildings with just the style of plaster, cement or composition ornaments that they wish. It is only necessary to submit the blueprints or drawings for residences, theaters, or other public buildings to the Architectural Supply Co. to secure either their figure on work shown or their advice regarding the complete decoration of the entire building.

### Roofing Slate

From the very beginning the purpose of the roof has been to keep off the rain. Consequently a great variety of materials have been used, all of them with more or less success for this one feature. There are however, many other considerations of the owner to think about in planning his house, for the architect to specify, or for the contractor to buy and put in place. A good quality of slate has always been a favorite roofing material and in this respect the Auld & Conger Co., of Cleveland, O., are particularly well adapted for supplying the right material. Dept. "D" of the above Company is prepared to send our readers

# Asbestos "Century" Shingles

*The Artificial Roofing  
Slate that Has the Personal  
Endorsement of  
the Leading Contractors*



**H**ERE is a typical instance of the way the alert contractors of this country are giving Asbestos "Century" Shingles their professional endorsement.

The illustration shows the residence of Mr. Wm. Hobensack, of Ivyland, Pa., designed and constructed by John Ramsey, leading contractor. Roofed and sheathed with Asbestos "Century" Shingles upon the recommendation of Mr. Ramsey is being the practical answer to the owners' demand for fire prevention and the elimination of painting and repairing expense.

As the leading fire resistant roofing on the market, Asbestos "Century" Shingles have the heartiest endorsement of practically all official insurance organizations, such as the Underwriters Laboratories, Inc., of Chicago, American Society of Fire Prevention, and the National Fire Protection Association.

If you are not in a position to furnish your clients with the facts about these Shingles, write us for terms, trade prices and samples.

**KEASBEY & MATTISON CO., Factors, Dept. H, Ambler, Pa.**  
*Branch Offices in Principal Cities of the United States*

## → "You Have Done a Splendid Job" ←

When a pleased owner says *that* to you, you have a right to feel proud. The one Ceiling which invariably calls forth this enthusiastic praise is

**"BERGER'S"  
Classik  
STEEL CEILINGS**

1. They are the most beautiful steel ceilings on the market and so designed that they harmonize with any school or period of architecture.
2. They are a wonderful fire retardant and perfect in construction, as witnessed at a late fire test in which they resisted, for 1 hour and 10 minutes (the entire duration of the test) a terrific fire which generated 1,800° Fahr. At the end of the test they were examined and found intact. Lath and plaster lasted just 6 minutes.
3. They can't fall and cause injury and death. Scarcely a week passes but what the press chronicles numerous accidents caused by ceilings falling. Think what a powerful argument this gives you in favor of non-collapsible steel ceilings!
4. No calking or tamping being required on account of their improved pressed bead and button construction you save from 25 per cent to 40 per cent on every job.
5. They are easily applied in old or new buildings of every style and type, are sanitary and last indefinitely.

Show our new Catalog to the Owner whose contract you are trying to secure. Its hundreds of beautiful illustrations and designs will help you get it. *Better write or 'phone our nearest Berger Branch for Special Catalog D. N.*

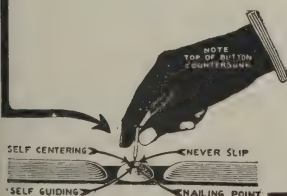
**The Berger Manufacturing Co., Canton, Ohio**

Largest Sheet Metal Works in the World

Our Nearest Branch for Best Service:

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Export Department: 11th Avenue and 22nd Street, New York City, New York



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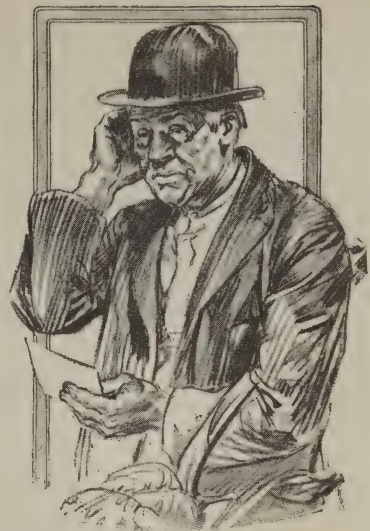
information regarding the various grades, sizes, colors and prices of their Roofing Slate, which they obtain from their own quarries.

### More Buildings in March Than a Year Ago

Building construction in the United States is on a fairly satisfactory basis and compares favorably with conditions a year ago. Permits were taken out in 101 cities in this country in March for 2,135 buildings in excess of the number for the same month a year ago, while there was a decrease in cost of \$9,732,574, or 12 per cent, according to official reports to *Construction News*. Permits were taken out in 101 leading cities in March for 26,751 buildings, involving a total cost of \$68,406,846, against 24,616 buildings for the corresponding month a year ago, aggregating in cost \$78,139,420. Building construction in some of the New York, New Jersey and New England cities, as well as in leading cities in the central and lake states, was characterized by wonderful activity, and while there were material decreases in some sections the conditions are on the whole encouraging. Losses were great in the South as well as in some of the leading points on the Pacific coast, both of which were to have been expected. The figures in detail are as follows:

Cities.	1915		1914	
	No. of Bldgs.	Estimated Cost.	No. of Bldgs.	Estimated Cost.
New York (Boros Man. and Bronx) ..	740	\$ 7,633,492	798	\$ 9,743,422
Chicago .....	1,096	7,403,750	931	7,729,800
Philadelphia ..	2,480	5,388,265	1,807	5,175,530
Boston .....	467	4,719,000	359	4,532,000
Brooklyn .....	1,426	4,296,815	939	3,736,130
Cleveland .....	1,483	4,022,035	1,409	4,070,255
Detroit .....	839	2,839,490	870	2,300,720
San Francisco ..	619	1,405,038	561	3,956,475
Minneapolis ..	541	1,372,530	542	2,093,915
Cincinnati .....	1,652	1,356,124	1,188	863,810
St. Louis, Mo. ..	922	1,268,878	910	1,450,034
Los Angeles .....	819	1,124,063	1,116	2,179,756
Pittsburgh .....	438	1,006,997	304	958,618
Rochester .....	387	1,000,000	274	775,030
Milwaukee .....	420	942,921	363	696,183
Indianapolis ..	743	889,349	562	784,404
Baltimore .....	612	882,701	378	918,362
Kansas City, Mo. ....	314	848,595	423	1,516,380
Buffalo .....	473	830,000	309	660,000
New Haven .....	146	825,470	106	425,380
St. Paul .....	205	822,624	138	2,343,949
Toledo .....	288	763,258	323	556,928
Washington, D. C. ....	443	714,826	387	1,544,778
Seattle .....	810	689,675	881	923,480
Newark .....	218	643,392	145	321,240
New Bedford ..	123	587,775	121	463,510
Springfield, Mass. ....	161	570,558	138	563,018
Columbus .....	335	519,200	293	655,995
Louisville .....	293	518,100	264	654,400
Portland, Ore. ..	527	503,755	708	882,965
Oakland .....	318	500,373	388	625,907
Akron .....	233	437,605	209	288,160
Charlotte .....	16	410,377	39	122,950
Evansville .....	148	402,327	120	107,615
Huntington .....	74	390,800	94	119,735
Worcester .....	168	353,360	119	351,228
Memphis .....	250	345,785	279	370,300
Albany .....	322	342,855	188	947,900
Omaha .....	84	332,860	147	321,165
Erie .....	126	296,966	215	199,784
Lawrence .....	24	288,880	21	72,040
Passaic .....	29	288,360	18	64,122
Richmond .....	133	284,826	170	539,848
Atlanta .....	277	267,417	342	561,644
Grand Rapids ..	195	260,429	517	1,239,253
Jacksonville ..	60	259,500	88	239,023
Wilkes-Barre ..	185	257,752	60	44,303
Fort Wayne .....	97	254,290	90	176,775
Youngstown ..	90	206,605	81	148,295
New Orleans .....	...	194,385	...	230,609
Trenton .....	138	192,868	69	170,080
Tacoma .....	137	192,450	170	137,968
Nashville .....	362	190,570	79	229,980
Canton .....	80	189,250	51	136,550
Brockton .....	59	186,008	54	191,775
Denver .....	267	181,130	435	311,610
Norfolk, Va. ....	67	180,694	76	346,845
Sioux City .....	36	167,675	93	286,535
Kansas City, Kans. ....	66	165,285	117	161,131
Reading .....	91	164,350	100	171,050
Portland, Me. ....	58	161,750	24	57,435
Peoria .....	39	159,175	48	408,560
Duluth .....	172	159,128	107	181,961
Birmingham ..	26	154,555	...	236,595
Cedar Rapids ..	28	152,000	35	170,850
Sacramento .....	139	148,725	164	236,174
Dallas .....	93	147,690	234	807,213
Berkeley .....	90	140,950	112	263,550
Stockton .....	62	140,814	59	105,481
Binghamton .....	177	134,878	114	133,869
Savannah .....	63	132,700	68	193,850
Des Moines .....	72	119,365	51	275,750
Scranton .....	82	116,974	43	48,808
Tampa .....	124	116,387	132	114,855
Dayton .....	74	112,465	57	363,885
Wilmington .....	...	108,326	...	211,000
Spokane .....	89	102,660	108	86,335
San Jose .....	63	97,971	45	79,315
Lincoln, Neb. ....	46	97,450	51	73,000
Elizabeth .....	36	96,508	38	112,579
Utica .....	76	94,855	39	37,735
San Diego .....	152	94,285	279	262,686
Springfield, Ill. ....	47	88,920	21	79,140
Haverhill .....	30	87,250	18	191,760
Schenectady ..	74	81,336	34	163,713
Saginaw .....	43	81,215	54	35,095
East St. Louis, Ill. ....	47	80,955	67	86,287
Topeka .....	48	73,500	50	37,320
Altoona .....	81	68,528	66	105,387
Troy .....	67	68,106	31	16,999
Superior .....	82	67,235	70	80,171
Butte .....	32	54,340	25	49,850
St. Joseph, Mo. ....	66	50,903	70	44,736
Hoboken .....	15	47,450	11	49,360
Chattanooga ..	131	40,865	188	111,410
Bayonne .....	13	39,747	30	46,543
Woonsocket .....	19	29,127	24	35,823
Auburn .....	...	27,265	...	61,950
Holyoke .....	20	24,725	22	43,865
Colorado Springs ..	27	22,700	27	14,178
Pueblo .....	15	8,360	24	33,720
Totals .....	26,751	\$68,406,846	24,616	\$78,139,420

There were gains in 48 and losses in 53 cities. The gain in Philadelphia was 4 per cent, Boston 4, Brooklyn 15, Detroit 21, Cincinnati 57, Pittsburgh 5, Rochester 29, Indianapolis 13, Milwaukee 35, Buffalo 25, New Haven 94, Toledo 37, Newark 100, New Bedford 26, Akron 52, Evansville 274, Huntington 226, Worcester, Mass., 1, Omaha 4, Erie 49, Lawrence 301, Passaic 350,



20 — 35 — 50

**At twenty** Bill thinks he's pretty lucky to be making two or three dollars a day. A husky, hard-working young fellow like himself is always sure of a job, so he isn't worrying about the future.

**At thirty-five** Bill wakes up to the fact that he can't earn a cent more than he could at twenty. There's still plenty of work for him, but the old wage doesn't go very far now that he has a family to support. Still, he's making enough to live on, and is content to let the future take care of itself.

**At fifty**, his usefulness about gone, poor Bill makes way for a younger man. Unfitted to make a living except as a common laborer, he'll have to struggle along on the few odd jobs that come his way. His future looks mighty blue to him now—he wishes he could have seen what was coming.

This is the fate of the untrained man—the man who works with his hands. Assured of steady work while he's young and strong, it doesn't occur to him that old age will rob him of his only means of support—that he'll be discarded like a worn-out machine.

# What about your future?

What will **you** be at fifty—a broken-down laborer or a prosperous professional man? Will you be walking the streets in search of work, or enjoying a comfortable income? The time to decide is **now**—before you're a day older. Will you fit yourself for something better than a laborer's job—will you make your future secure?

For over eighteen years the **American School** has been training men everywhere for important posts in life. It has trained thousands for entrance into the big resident colleges. It has trained even more in all branches of **Engineering, Business and Law**. The **American School** will give you the training you need to become a successful, well-to-do man, no matter where you live or what you do. You won't have to give up your work—we train you at home, in your spare time. Not only this, but you can pay for your course as you progress.

Fill in and mail the coupon now—it's the first step toward an independent old age.

# American School

of Correspondence, Chicago, U.S.A.

This school has no connection with any other school using the name "American"

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Mark the position you want and mail the coupon now

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| ....Structural Engineer       | ....Bookkeeper          |
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| ....Mechanical Draftsman      | ....Fire Ins. Expert    |
| ....Civil Engineer            | ....Sanitary Engineer   |
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Wilkes-Barre 481, Fort Wayne 44, Youngstown 39, Trenton 13, Canton 39, Portland, Me., 182, Scranton 140, St. Joseph, Mo., 14, Lincoln, Neb., 33, Utica 151, Springfield, Ill., 12, Saginaw 131, Troy 301, Colorado Springs 60.

The losses were not as conspicuous in March as in the preceding months. In the large cities the most significant decreases were: In New York 22 per cent, Chicago 4, St. Louis 12, Cleveland 1, St. Paul 65, Minneapolis 34, Kansas City 44, Columbus 21, Albany 64, Grand Rapids 79, Brockton 3, Denver 42, Sioux City 41, Peoria 61, Duluth 13, Cedar Rapids 11, Sacramento 37, Dallas 82, Des Moines 57, Dayton 69, Wilmington 48, Elizabeth 14, Schenectady 50, East St. Louis 6, Altoona 35, Superior, Wis., 16, and Pueblo 75.

Construction was retarded in the South, but the losses will be more than made up with the returns from the cotton crop. There were losses in Washington of 54 per cent, Baltimore 4, Louisville 21, Memphis 7, Richmond 47, Atlanta 52, New Orleans 15, Nashville 17, Norfolk 48, Birmingham 35, Savannah 32, and Chattanooga 63.

The Pacific coast cities for the most part show a falling off with few exceptions. There were losses in San Francisco of 64 per cent, Oakland 20, Sacramento 37, Berkeley 46, Los Angeles 48, San Diego 64, and Portland, Ore., 43; in San Jose there was an increase of 24 per cent, Stockton 33, and in Spokane 19, and Tacoma 39.

### Carbo Steel Posts

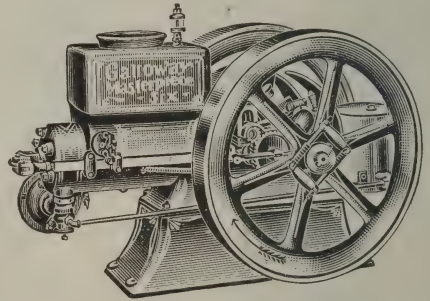
Aside from the fact that property is becoming valuable there is a natural desire on the part of every land owner to permanently fix the boundary of his possessions. Ordinary fences are suitable for some purposes and positions but there is an insistent demand for a more dignified fencing than common posts and barb-wire. The Carbo Steel Post Co., 245 Rand-McNally Bldg., Chicago, in their illustrated booklet show a great variety of posts, fences, etc., which they claim are age-proof, rot-proof, fire-proof and vermin-proof. The posts are readily set up without the use of concrete and every conceivable combination of corners, gates, ends, braces, etc., are fully shown and priced.

Carbo Posts are obtainable from dealers

at a price within the means of every home owner. The complete line of Carbo materials is shown in the illustrated booklet which they will be glad to send to our readers on request.

### Engines for the Contractor

The catalog of the William Galloway Co., 2315 Galloway Sta., Waterloo, Iowa, contains descriptions of a number of engines of interest to the contractor. The manner in which the various styles are shown en-



A Galloway Engine.

ables the contractor to inspect each one separately and to select the one which will do his work to the best advantage.

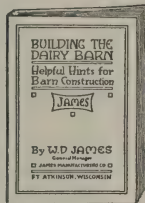
The catalog also describes and prices a great variety of other machinery and apparatus for the contractor, including wagons, harness, auto trucks, pumps, cement mixers, etc. The catalog will be sent to our readers on request and will prove to be of value and interest.

### Tapered Asphalt Shingles

There are several reasons for making Asphalt Shingles as they are made by the Beckman-Dawson Co., 1415 Association Bldg., Chicago, Ill. In the first place they are made of Asphalt in order to be proof against the weather. In the second place they are made tapered so that the greatest amount of material may be placed where the hardest wear comes. Third, they are shaped practically the same as wood shingles as that is a convenient size to handle, the workmen are accustomed to that size and shape and they can be laid to a perfectly tight roof.

The Beckman-Dawson Co. make their Asphalt Shingles in a variety of colors so

## A Free Book Of Money-Saving Ideas For Dairy Barn Builders



You will be interested in reading "Building the Dairy Barn." It tells many of the things learned by W. D. James—America's foremost dairy barn designer. It will help you make more money.

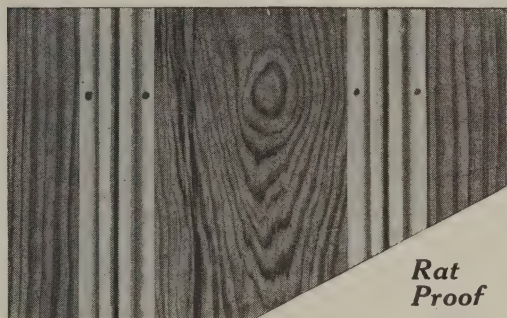
It tells about the new plank frame construction, the famous King system of ventilation, perfect lighting, proper width and arrangement. It tells about stable floors, site, size, appearance, design, drainage and equipment. And it shows four floor plans of barns that have attracted wide spread attention.

You can obtain a copy of this valuable, helpful book **free**. Merely answer these few questions and the book will come by return mail. For whom do you expect to build or remodel dairy barns? (Give names and addresses.) When? For how many cows? Address

James Mfg. Co., C. Q. 102 Cane St., Ft. Atkinson, Wis.

### Special Offer of Blue Prints

Mr. James wants to make you a special offer of complete working blueprints of modern dairy barns of different sizes and types. Also ask how to secure free help from our architectural departments. Write today.



Rat Proof

## Metallic Batten Strips For Barn Siding

And other buildings where vertical siding is used. These Batten Strips expand and contract with siding; no warping, splitting or drawing off. Metallic Batten Strips make the building wind, rain and snow proof, always lay flat, do not interfere with sliding doors and add to the beauty of the building.

Write for prices and free samples

Metallic Batten Company, Department M, Owensville, Ind.  
Canadian Representative: Taylor Mfg. Co., Hamilton, Ont.

Commodious residence of Mr. S. L. Corey, Buffalo, N.Y.



## Cuts Plastering Costs

The flat ribs of Herringbone spread instead of cut the stucco and plaster. The material goes further. On the scratch coat there is often a saving of 30%.

Herringbone is rigid—offers a firm surface for plaster and insures an even coat.

## Herringbone Rigid Metal Lath

goes up fast. Has interlocking selvage edges. Wiring between studs is unnecessary. Learn the whole truth about Herringbone. Just ask us for the Herringbone Booklet. It's free. Get it, use it, and it will be valuable. Send today.



The General Fireproofing Co.  
650 Logan Ave., Youngstown, O.

Makers also of Self Sentering—the concrete reinforcing that eliminates the need of forms.



Trade Mark  
Reg. U.S. Pat. Off.

Herringbone Armco Iron Lath, the most rust-resisting metal in the world was used in the Woolworth Building and many others.

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ON LETTERS YOU  
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that a great variety of decorative schemes can be readily worked out. They are prepared to send our readers samples, prices, etc.

### The Ideal Contractor's Hoist

Every contractor in the building business has or should have a dependable hoist by which he can raise materials for the buildings under construction. In past years these have been operated mainly by steam, but the widespread use of gasoline engines and electric motors has made these forms the power available for the contractor and means that the high priced stationary engineer is no longer required for this work.

The Original Gas Engine Co., Kalamazoo St., Lansing, Mich., in their complete catalog No. 415 show their line of hoisting equipment as well as the various other contractor's machinery which they manufacture. The catalog will show our readers some of the latest ideas in construction as well as show them how money can be saved through the use of this equipment.

Advertisers' Section.

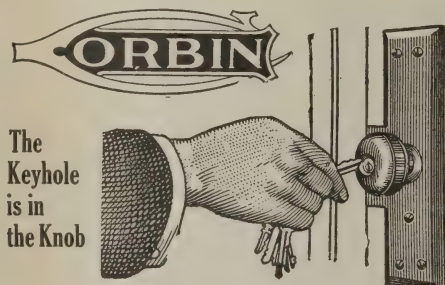
### Galvanized Iron Cut Nails

If there is one place where permanent work is required it is about a building. Any perishable materials should be kept away from any place where their life will be shortened by exposure to the weather or by the deterioration incident to ordinary use. For shingles, slating, sheathing, fencing and in fact all exterior work, common nails cannot be depended upon to last indefinitely. On the contrary, the Galvanized Iron Cut Nails, made by the E. & G. Brooke Iron Co., Birdsboro, Pa., will out-last any ordinary wood construction under the severest climatic and weather conditions. The E. & G. Brooke Co. will be glad to send our readers prices on the various sizes of Galvanized Iron Cut Nails which they make in their factory as well as samples of any desired sizes or styles.

"Our esteemed fellow citizen John G. Harris, will go to the hospital tomorrow to be operated on for the removal of his appendix by Dr. Smith. He will leave a wife and three children."—Lippincott's

## Let Me Send You A New Builders' Hardware Catalog

The new catalog now coming off the press is the most comprehensive we have ever issued. The line of Builders' Hardware shown is complete. It fully describes the new designs in the famous Corbin Line.



And this is one of the exclusive features in Corbin Locks. You'll see them on houses of the better class as well as office buildings. Write today for this new catalog.

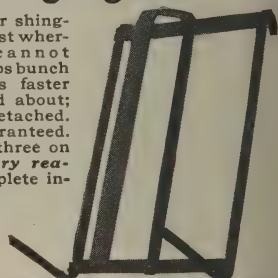
**Gregg**  
Hardware Co.  
44-46 Cadillac Square

Detroit,  
Mich.

## Richards Shingling Bracket

Great convenience for shinglers. Holds shingles just where wanted. Wind cannot blow them away. Keeps bunch in good order. Allows faster work. Easily moved about; weight bar can be detached. Strong, well-made. Guaranteed. You can use two or three on your jobs. Price very reasonable—send for complete information. Do it now.

Richards  
Shingling Bracket Co.  
Toledo, Iowa



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M. H. Ireland,  
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WONDERS—

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can do with Little

Wonders you can

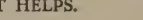
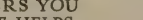
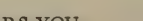
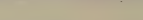
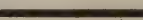
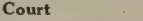
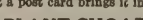
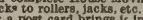
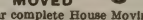
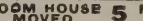
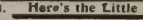
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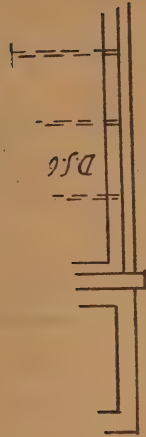
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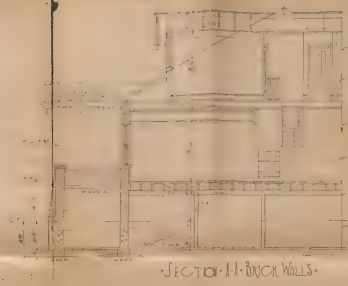




• SIDE ELEVATION •



• BUILDING DETAILS •



• SECTION II - BRICK WALLS •

SUPPLEMENT TO  
**THE NATIONAL BUILDER**

MAY, 1918

NATIONAL BUILDER DESIGN No. 26, A HOME RESIDENCE.

Alternate Sections are shown for Frame and Tile Walls.

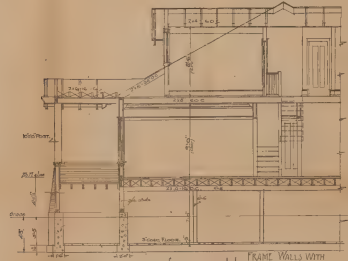
Scale for plan, elevation and section, 1 inch equals 4 feet. Scale for detail, 1 inch equals 1 foot.

FOR DESCRIPTION AND ESTIMATES, SEE PAGE 25

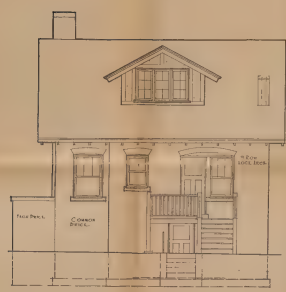
This House is Shown in Colors in Three Styles on Front Cover.



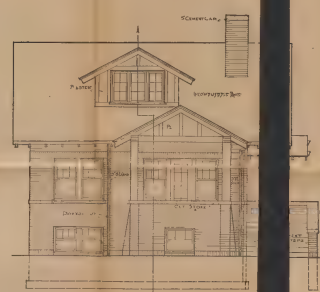
• DETAIL - DISCARDED •



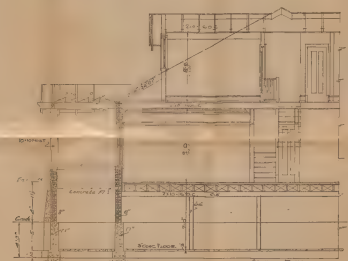
• SECTION II - FRAME WALLS WITH NARROW JOISTS •



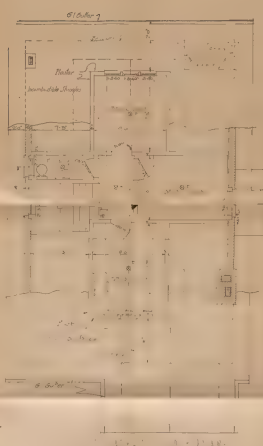
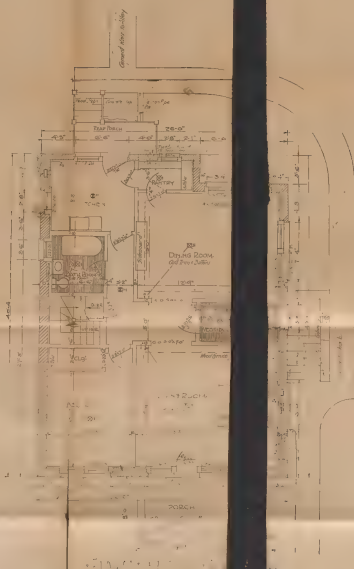
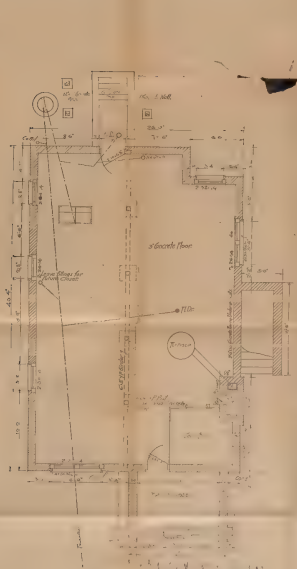
• REAR ELEVATION •



• FRONT ELEVATION •



• SECTION II - STUCCO FINISH OR HOLLOW TILE •





For WORKING PLANS *and* ESTIMATE  
FREE SUPPLEMENT *and* PAGE 35

1st Year    ☐☐    ☐☐    ☐☐    PRICE 15 CENTS



# Let's talk over this Clinton Wire Lath proposition

A builder is known by his work. It behooves him to use the best of materials—impress his customers with the advisability of specifying them.

## Clinton Wire Lath

is far more superior to wooden lath and may be laid more easily and quickly. CLINTON WIRE LATH is by every test an ideal plaster-support both for inside and outside work.

For over half a century CLINTON WIRE LATH has been known and specified by the greatest builders of the country.

Buildings in which CLINTON WIRE LATH was laid fifty years ago have been recently torn down and the lath was found to be as good and serviceable as the day it was put in.

We want every carpenter and builder in the country to have our "Clinton Handbook on Lath and Plaster," also our book "Successful Stucco Houses." It is shown in these works—first that a house in which CLINTON WIRE LATH is used is far more fireproof and ratproof than the ordinary dwelling—second that a stucco house should **never** be built **without** the specification of CLINTON WIRE LATH.

You can lay CLINTON WIRE LATH and make your profit the same as if wooden lath were used. We can give you enough data and proof to convince any reasonable man that CLINTON WIRE LATH is the ideal lath for the support of plaster and stucco.

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**First Power Loom Weavers of Wire Cloth in the World**

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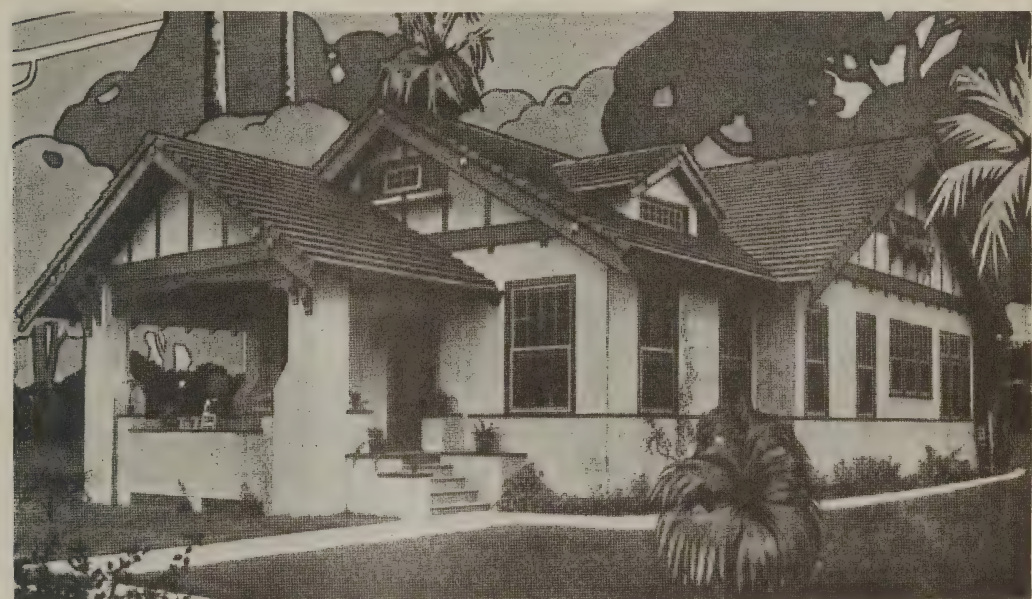
Advertisers' Section

# THE NATIONAL BUILDER

Vol. 57 (51st Year)

Chicago, June, 1915

No. 6



A Bungalow Built in Florida, But Suitable for Any Climate

NATIONAL BUILDER DESIGN NO. 396  
Bonfoey & Elliot, Architects, Tampa, Fla.

For Floor Plans, Sections, Details and Full Working Drawings, see Double Supplement of this month. Estimated Cost, \$3,704.20\*

## Estimate of a Pleasing Bungalow

I. P. Hicks

EXCAVATING		7 6x8x12 ft. sills .....	336
20 yards, 35c .....	\$ 7.00	12 6x8x18 ft. sills .....	864
MASONRY		2 6x8x20 ft. sills .....	160
2,180 brick laid in piers, \$14....	30.52	1 6x8x10 ft. sills .....	40
12 lineal feet chimney breast,		52 2x8x16 ft. first floor joists..	1,092
\$2.50. ....	30.00	40 2x8x20 ft. first floor joists..	1,080
10 lineal feet above breast, \$2	20.00	52 2x8x16 ft. second floor joists	1,092
350 yards stucco plaster, \$1.20.	420.00	40 2x8x20 ft. second floor joists	1,080
Total masonry .....	\$ 500.52	180 2x4x10 ft. outside studs ...	1,170
LUMBER BILL		60 2x4x12 ft. gable studs .....	480
	Feet	20 2x4x16 ft. sleeping porch ..	220
3 6x8x16 ft. sills .....	192	180 2x4x10 ft. partitions .....	1,170
* Materials are figured at Omaha prices. Carpenter labor figured at 50 cents per hour.		2 2x6x14 ft. plates .....	28
		10 2x6x10 ft. partitions .....	100
		34 2x4x12 ft. plates .....	272
		40 2x4x16 ft. plates .....	440



30 2x4x16 ft. miscellaneous use	330
100 2x6x18 ft. rafters	1,800
20 2x6x16 ft. rafters	320
4 2x8x24 ft. valley rafters	128
60 2x6x12 ft. rafter ends	720
6 4x6x18 ft. purlins	216
6 4x4x12 ft. purlins	96
6 2x4x16 ft. braces	66
30 1x6x12 ft. braces	180
50 1x4x12 ft. bridging	200
48 2x4x16 ft. collar beams	528

Total feet framing..... 14,400

14,400 ft. framing lumber, at \$26 \$	374.40
3,200 ft. sheathing, \$26	83.20
3,100 ft. sheathing, roof, \$26	80.60
12 rolls tarred felt, \$1	12.00
2,080 ft. 2¼ face clear, flg., \$45	93.60
320 ft. 3¼ face porch flg., 12 ft., \$45	14.40
320 ft. 5⁄8x4x12 ft. ceiling, \$30, porch	9.60
1,120 ft. 5⁄8x3⁄4x12 to 16 ft. ceiling for cornice, \$40	44.80
2 2x10x24 ft. finish verge boards, \$50	4.00
2 2x10x26 ft. finish verge boards, \$50	4.35
1 2x10x16 ft. finish verge boards, \$50	2.70
2 2x10x12 ft. finish verge boards, \$50	2.00
8 1x12x16 ft. finish, belt course, \$45	5.76
12 1x10x16 ft. finish cornice, \$45	7.56
12 1x 8x16 ft. finish cornice, \$45	5.94
8 1x 6x14 ft. finish cornice, \$45	2.52
6 1x 4x14 ft. finish cornice, \$45	1.35
6 2x12x12 ft. finish steps, \$50	6.48
10 rolls tarred felt, \$1	10.00

Total lumber bill.....\$ 765.26

## MILL WORK

4 cornice brackets, \$1.50	\$ 6.00
18 beam corbels, 60c	10.80
19 dental brackets, 15c	2.85
612 ft. 2-in. bed mold, 1c	6.12
196 ft. 1½-in. bed mold, ¾c	.98
300 ft. 7⁄8-in. cone mold, ½c	1.50
140 ft. 1½x6-in. casing, 3c	4.20
Screens for porch	30.00
1 outside door frame, 3 ft. 4 in. x 7 ft. 6 in., raf., 1¾ side lt.	7.00

1 outside door frame, 3 ft. 0 in. x 7 ft. 0 in., raf. 1¾	3.00
2 window frames, 38x36, 2 lt., \$2.25	4.50
2 window frames, 34x36, 2 lt., \$2.50	5.00
1 triple frames, 26x26, 2 lt.	7.50
1 triple frames, 22x48, 1 lt., transom 22x16	7.50
1 twin frames, 30x48, 1 lt. transom 30x16	5.00
3 frames, 44x36, 2 lt., \$2.50	7.50
4 frames, 22x36, 2 lt., \$2.25	9.00
2 sash frames, 32x24, \$1.50	3.00
1 sash frames, 44x36	1.75
2 Louvre frames, 58x12, \$6.75	13.50
1 Louvre frames, 30x12	6.00
1 gable frames, 58x12	2.00
2 windows, 38x36, top sash divided, \$6	12.00
2 windows, 34x36, top sash divided, \$4.60	9.20
3 windows, 26x26 top sash divided, \$2.35	7.05
3 windows, 22x48, tran., 22x16, \$2.80	8.40
2 windows, 30x48, tran., 30x16, \$3.00	6.00
3 windows, 44x36, top sash divided, \$6.25	18.75
4 windows, 22x36, top sash divided, \$2.90	11.60
2 sash, 32x24, divided, \$1.80	3.60
1 sash, 44x36, divided	3.40
3 sash 58x12, divided, \$3	9.00
1 sash, 30x12, divided	2.40
9 set door jambs, 2 ft. 8 in. x 6 ft. 8 in., 80c	7.20
6 set door jambs, 2 ft. 6 in. x 6 ft. 8 in., 75c	4.50
2 set door jambs, 2 ft. 4 in. x 6 ft. 8 in., 75c	1.50
1 set jambs, cased opening	1.20
2 columns and trim	10.00
1 set jambs, colonnade book case opening with trim all complete	40.00
1 front door, 3 ft. 4 in. x 7 ft. 6 in. x 1¾	16.00
1 outside door, 3 ft. 0 in. x 7 ft. 0 in. x 1¾	5.00
9 doors, 2 ft. 8 in. x 6 ft. 8 in. x 1¾ in., \$2.60	23.40
6 doors, 2 ft. 6 in. x 6 ft. 8 in. x 1¾ in., \$2.55	15.30
2 doors, 2 ft. 4 in. x 6 ft. 8 in. x 1¾ in., \$2.50	5.00

180 ft. beam ceiling, 10c .....	18.00
308 ft. window casing, 14 ft., 3c.	9.24
456 ft. casings for doors, 12 ft., 3c	13.68
264 ft. head casing, 3c .....	7.92
269 ft. cap mold, 3c .....	7.92
420 ft. window stop, 14 ft., ½c..	2.10
324 ft. door stop, 14 ft., ¾c.....	2.43
88 ft. window stool, 2½c .....	2.20
88 ft. window apron, 2½c .....	2.20
570 ft. base, 4c .....	22.80
280 ft. picture mold, 1½c.....	4.20
42 ft. plate rail, 12c .....	5.04
Stairs. ....	18.00
China closet .....	18.00
Cooler. ....	25.00
Linen closet .....	10.00
Shelving, pantry .....	8.00
Mantel book cases .....	20.00
Total. ....	\$ 561.93

## CARPENTER LABOR

14,400 ft. framing lumber at \$10 \$	144.00
6,300 ft. sheathing, \$10 .....	63.00
640 ft. porch floor and ceiling, \$15. ....	9.60
2,080 ft. flooring, \$20 .....	41.60
15 squares smoothing floors, \$1.50. ....	22.50

262 lineal ft. main cornice, 20c	52.40
64 lineal ft. sleeping porch cornice, 18c .....	11.52
94 lineal ft. belt course, 8c..	7.52
170 lineal ft. window band, 3c	5.10
Porch steps .....	7.20
Finishing, 45 per cent cost of mill work.....	252.87
Total .....	\$ 617.31

## THE COMPLETE ESTIMATE

Excavating. ....	\$ 7.00
Masonry. ....	500.52
Lumber. ....	765.26
Millwork. ....	561.93
Mantel. ....	60.00
Carpenter labor .....	617.31
Nails and hardware .....	66.00
Tin and sheet metal work.....	30.00
Metal tile roofing, 30 sqrs., \$8.00.	240.00
Wall Board, 71 sqrs., \$3.00.....	213.00
Gas fitting .....	20.00
Plumbing. ....	260.00
Electric wiring .....	42.00
Painting. ....	145.00
Incidentals, 5 per cent.....	176.18
Total estimate .....	\$3,704.20

## How To Use This Estimate

This estimate is figured at Omaha prices, with carpenter labor at 50 cents an hour. To use this estimate for other localities the reader will note that the price of each grade of lumber, as well as all other materials, is given in the regular trade units, that is, per thousand feet for lumber, per thousand for shingles, per cubic yard for excavating, etc.

It is a simple matter to substitute the prices current in your vicinity for the prices

given in this estimate and to extend the quantities and so determine the exact cost for your neighborhood.

For instance, framing lumber may be \$30 per thousand in your town while it is figured in this estimate at \$26. Simply extend the number of feet at \$30; labor may be more or less. The owner may want to contract for the furnace or plumbing separately. The detailed estimate makes these changes possible.

## The Object of the Home

**W**HETHER one lives in Saskatchewan or Florida, Maine or California, the purpose of the Home is practically the same. In showing a home in Florida we are therefore doing more than featuring that locality, for everyone can pick out features that appeal to them, and that are as applicable to one section of the country as another.

The first object of a home is stability. It

locates the man in a given neighborhood. It stamps his individuality on the neighborhood more than any one thing. One well kept place shows up the neighbors and if they have any pride, their grounds are cleaned up too. The owner of a well kept place soon tires of living in an inferior neighborhood, so he deserts it, at the earliest possible moment for another part of the town where customs more like his own pre-



vail. Look over your own town and see if this is not true.

The next object of a home is protection. Society has regulated matters so protection from outside enemies is reasonably sure. The criminal element in the main is in the minority. The home provides security, although not proof against a 42 cm. gun.

Protection from the weather is also obtained. A roof, ornamental as shown in the subject of this sketch, is also emphatically useful, for only those who have lived in the extreme South appreciate how hard it can rain. In other sections equal provision must be made against snow and wind, and in some sections against dust and sand. Strange to say, the roof which sheds one sheds practically all the elements.

Now, secure in the location, and protected as far as human ingenuity can devise, the home must awaken respect in others. Only in that way can the community hold up its head. A barn-like structure built on the factory plan, proclaims itself as the abode of those practically deficient in aesthetic ideas, apeing their neighbors in size only. It seems as if some forget that size does not always indicate quality.

So the home must have appearance or style. Not that it must be an architectural gem, but it must proclaim its purpose, indi-

cate the refinement of the tenant and avoid the appearance of crudity, falsity and ignorance.

What has been said of the exterior appearance is equally true of the interior. The plan will often reveal character as quickly as the exterior and even after the architect has completed his work; the tenant may spoil the entire effect by ill-assorted furniture and furnishings, cheap and gaudy wallpaper and a tangle of nondescript shrubbery about the lawn.

The architect may plan well, the contractor may build, but the owner or tenant determines just what the place will be. Sometimes we feel that the contractor and the architect misunderstand the owner and design, and build, and provide him a home unsuited for his personality. The better the home is planned and built and furnished, the easier it is for the owner to take his place among men and the more respect others will have for him. This does not mean *cost* for that element is entirely beside the question. It concerns only the appearance and suitability, and this particular house would dignify a clerk or a banker, a laborer or a professional man. It is the use to which a place is put that gives it its character. Let us bear this in mind, when we plan or build, or when we are the owner or the tenant.



A Brick Residence

Burd F. Miller, Architect

# EDITORIAL

## NOTES AND COMMENTS

The Mechanic who makes a mistake does not blunder, but when he blunders, he makes an unpardonable mistake.

\* \* \*

The world is progressing day by day, even when mankind is bent on destroying itself. A new machine today, or a new tool tomorrow may be brought to your notice. Don't discard it because it is new. Examine it: if found good, give it a place in the sun of your good opinion, even if you do not make use of it.

\* \* \*

When you hustle, see that you hustle systematically, and follow the line. Never let the hustle divert your attention from the plummet point, the lines of true square, or cause you to make a wobbly circle. Rather cease the hustle, and make haste slowly, if necessary to make good and correct work.

\* \* \*

One of our most beautiful of decorative materials, and one that is not beyond the reach of a moderately sized purse, is jasper. It is a beautiful material, abundant, not very costly, and wherever used, always proves satisfactory, its qualities being unsurpassed and have been recognized from the earliest times. It is frequently mentioned in the Bible, as one of the precious stones. It is rich and deep in color, and no other decorative stone exceeds it in artistic effects, or beauty of appearance. Strong and durable with lasting polish, jasper requires practically no upkeep. It should be more in evidence in this country than it is, for, we are sure, if more were known of it, it would soon become a favorite material.

\* \* \*

We are rapidly getting away from the "Baby-Carriage" and "Trolley Car" period and getting into the swirl of a new era of transportation in the shape of the "Jitney Bus." Thousands of people who looked at the Jitney upon its first appearance as a sort of foolish and unnecessary innovation, now gladly accept the opportunity it offers to land them where they wish to go. The following, taken from a San Franciscan

paper, describes the situation as it is found in that and many other cities.

"Unheralded there appeared a few months ago on Market street a dilapidated motor car bearing a roughly painted sign 'Jitney Bus—Fare Five Cents.' At first no one gave heed to the intruder, but when a second and then a third appeared with a constantly increasing patronage, the public realized that the street car company at last had a competitor. Within a fortnight more than a hundred of the new conveyances were in operation. Discarded motor cars were taken from warehouses, patched up, and put into service, until now more than 200 of them are in operation. The public eagerly patronized them, first, because they are giving a more efficient service than the street car company, and, secondly, because almost every San Franciscan feels that he has a personal grievance against the concern which has so long held a monopoly of the streets.

"The success of the Jitney naturally meant that the earnings of the street car company were seriously affected. Before long, the company asked for an investigation, stating that the busses were taking thousands of dollars per day away from them, and that if some preventative action were not shortly taken the company would be forced into a receivership. An ordinance was formulated ostensibly to regulate the new service, but in reality to levy a tax on the jitneys in the form of a license, which would force the driver to collect a ten-cent fare and thus throw travel back to the street cars again. The reply of the Jitney drivers was to form a protective organization. Such a show of strength was made that nothing has yet come of the attempt to handicap the new service. It would seem, also, that the feeling of the populace is so strongly in favor of the Jitney, or against the tramways, that any attempt to restrict the action of the busses would compel the retirement of the city officials responsible for such action. The Jitneys, apparently, are getting the shorter hauls and the tramways the longer. This is likely to result in a protest on the part of the tramways concern, it



being claimed that it is unfair to let the Jitneys scoop the cream off in this manner without assuming some of the unprofitable portion of the transporting business."

\* \* \*

The outlook in the building trades at the present time, are more encouraging than they have been for some time. While there are plenty of men ready to go to work, the pressure of scarcity in industrial countries is visibly less than a month ago, there is much more need for labor in sight. Chicago alone has large sums to expend on new building improvements this year and it looks at this writing as though it were enough to employ the required workmen. Already work on a sixty-five million job which is to be expended on the erection of a new union passenger terminal has begun. The city council passed an ordinance granting the Pennsylvania railroad the right to erect freight sheds and other structures, and over two hundred men are now at work, and others are being employed regularly from time to time. Beside this big contract, there are many others of big dimensions being given out daily. This denotes the incoming of good times, with abundance of work, for all who care to take part in the prosperity wave.

\* \* \*

St. Paul, Minnesota, is about to expend from fifteen to twenty million dollars this summer on a new Union station. Plans have been prepared by a Committee of Engineers and Architects, headed by Ralph Budd, Assistant President of the Great Northern Railway. The proposed station will be the property of nine railroads and will be used by them, which will be found a great convenience to the trading public. Like Chicago, St. Paul has a number of other large contracts to give out, which will tend to make things lively this summer in the Northwest city.

\* \* \*

Of all things that disturb the feelings of a person possessing an artistic soul, the slovenly arrangement of doors and windows in a room, seem to be about the worst, as they are constantly grating on their nerves. Recently the writer visited a house which seemingly was well finished with hardwood floors, stairways, etc. In the dining room, however, there were three

doors and a window, the tops of which were at three different heights, and the effect was not as pleasing to the eyes as if they had been uniform. The two doors on the north, one leading to the kitchen and the other to the hall, were the same height, the top of the door at the west end of the room leading to the parlor was at a lower level, and the top of the window at the south side was the highest. It isn't always possible or advisable to make the tops of the windows the same level as the top of the doors. The doors should, however, be a uniform height unless there is some special reason for making them otherwise, such as a special doorway leading from the hall to a dining room, parlor or sitting room. In such a case a special size door is often adopted and adds greatly to the attractiveness of the house. It is the little considerations of this sort that go far towards making a home attractive and pleasing.

\* \* \*

The question of "quantities" is a very important one in the making up of estimates, and on this account Architects and Draftsmen should be very precise in making up their plans and details, that the estimator will not be led astray by any careless line or false dimensions. Where possible, it is always the better way to write the figures on the details, giving full sizes of each one of them. It would be almost impossible for the workman to make a mistake when taking off sizes, and it would place at the disposal of the estimator, perfect exactness, and leave no chance for doubt in the mind of the figurer as to what is intended on the drawing. This eliminates a lot of chances for mistakes, clears the ground of all doubt and adds but little more work to the maker of the plans, only those who have closely followed the plans leaving an Architect's office know on the completion of the work how often drawings are defective and found to be a source of trouble and dissatisfaction. We have seen drawings in which a very important part of the work has been left out altogether, and then the contractor, having to suffer a loss, and put to much inconvenience besides, wants to know who pays for it. If a quantity surveyor has been employed the chances of these deficiencies would have been reduced to a minimum.



The Front Indicates Hospitality

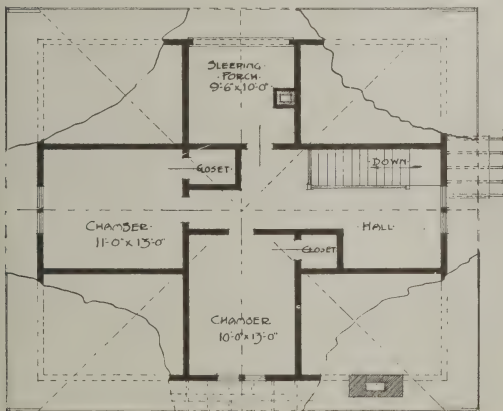
# Low Cost With Pure Bungalow Feeling

*Jud Yoho, Architect*

AS we sit here looking at the photographs which illustrate this article, we are wondering if there breathes a man or a woman who will not be stirred by the absolute beauty of this bungalow? Here indeed is something pretty. No one can resist the charm of perspective, of detail, of texture like this. This house comes right up close to you—it is friendly; the roof droops down till you can well-nigh touch it and there is an agreeable familiarity in every board, every shingle and

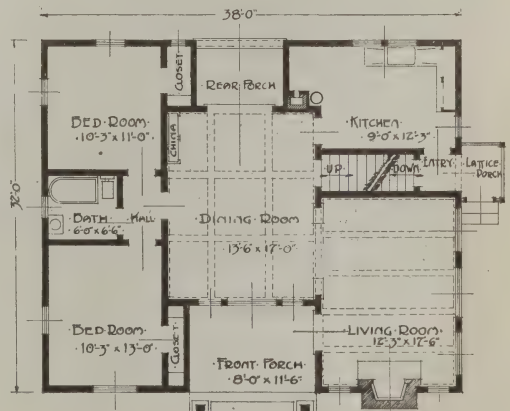
every brick; nothing cold, nothing forbidding and distant about this building. It fairly talks to you. We think half the charm of bungalows is due to this quality—they seem so near to one, so sociable, and so agreeable, like a friend that is never cold. Mere "houses" can never give off this atmosphere.

Nor will the reader be disappointed upon investigating further. At every angle this beautiful design will stand inspection. The ensemble is as pleasing as the detail—the



-ATTIC FLOOR PLAN-

-NO. 334-



-FIRST FLOOR PLAN-





Shrubbery Adds to the Beauty of a Bungalow

detail is as finished as the ensemble. Everything is here—a basement that is light and serviceable, a roomy and useful second floor, a warm, durable, thoroughly practical building.

This bungalow is peculiarly adaptable to a corner lot, or one with at least fifty feet of width. It will be noticed that, exclusive of the porches, the house is 38 feet wide and only 32 feet deep. The rear entry in this case it at one side, rather than behind the house—an arrangement that has a number of advantages. We like the front porch, too—it is such a satisfying relief from the stereotyped projecting sort. The projecting brick piers and pergola are just enough to dress up the front and avoid what would otherwise be a flat and uninteresting facade.

The texture of the wall is very pretty indeed. The design calls plainly for a rough texture. The shingles are laid alternately in wide and narrow courses, for the body of the walls; and clinker brick is used for the masonry. The design, too, calls for light colors. In the house illustrated, the shin-

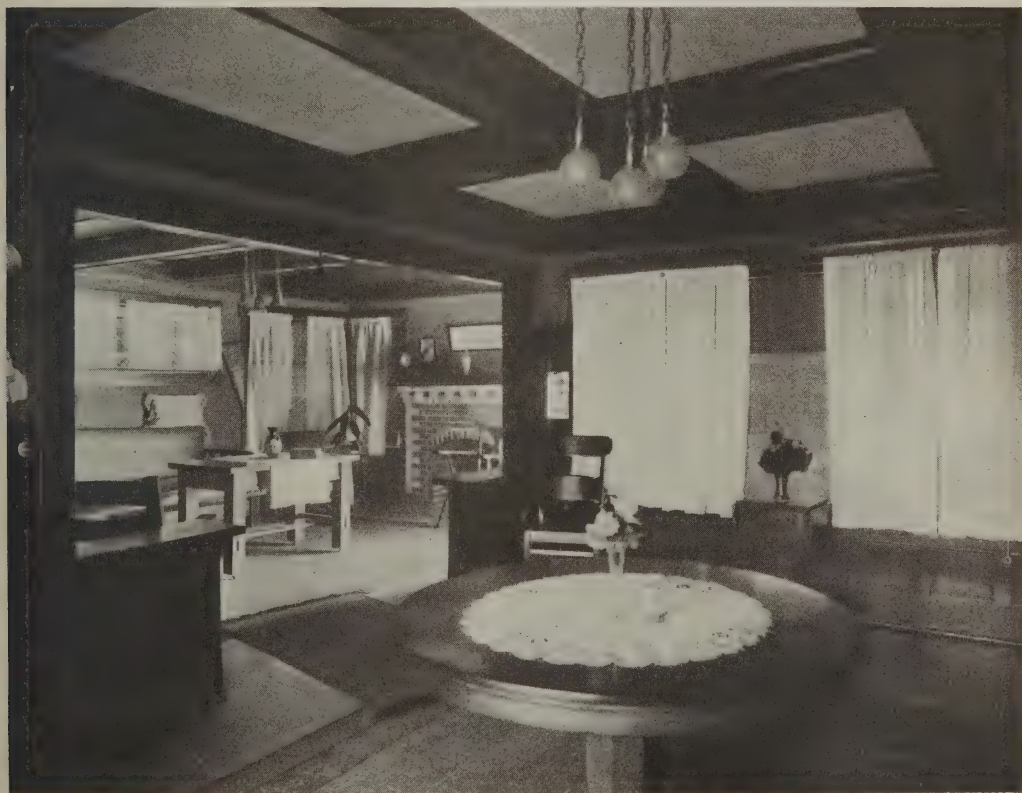
gles of the walls are stained silver gray and the trim, including sash, is white. The roof may be light green, brown or slate. Such a combination is hard to improve upon.

The shrubbery around the house adds immensely to the effectiveness of the design. Banked against the walls in profusion, it sets the house off splendidly.

Within doors we find a very good arrangement withal—in fact, a very excellent arrangement. And there is a whole lot of space in this house, too, with the five large rooms on the first floor, the two big bedrooms and the sleeping porch up-stairs, and a half basement underneath.

The recessed rear porch is a feature that will please many, especially in mild climates. In more rigorous climes, this porch can be enclosed with removable glass sash and converted in winter into a breakfast room, a sewing room or a little conservatory, as fancy may dictate.

The two principal rooms are above the average size—a good fault. The circulation in these rooms is very good. The two



The Dining Room and Living Room Are Separate, But Practically One





The Rear of the Bungalow. Note the Screened Porch and Sleeping Porch

interior views give an idea of the spacious effect produced. The dining room is paneled and both principal rooms have beamed ceilings. These always give a dressy effect and are inexpensive as compared to the added attractiveness they assure.

As the living rooms are well lighted, the woodwork is finished in mahogany. The little hall between the bedrooms is white enamel. A sash door to the bathroom lights the hall. The bedrooms are very dainty and light in lead blue.

The original of this design was built in Seattle at a cost of \$2,250.00. Common lumber was worth \$12.00 per thousand feet; cement, \$2.00 per barrel; sand and gravel, \$1.50 per yard; brick, common, \$10.00 per

thousand; clinker, \$16.00 per thousand; shingles, \$2.25 per thousand; finish lumber, \$24.00 per thousand feet; flooring, No. 1, \$35.00 per thousand feet; carpenters, \$4.00 per day; laborers, \$2.00 per day. The price given for the completed house includes hot air furnace, \$125.00; also painting, \$125.00; light fixtures, \$75.00, and everything complete.

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A party, seeking to recover on a contract which he has not completely performed, must have substantially performed the contract, and must have attempted in good faith to perform it.—*Hennessey v. Preston*, 106 N. E. (Mass.) 570.



The Bungalow Must Be Designed to Be Seen from the Side as Well as the Front



One Can See the Whole Dining Room from the Living Room



# Sliding Doors for Cupboards and Lockers

*E. J. G. Phillips, Engineer, Richards-Wilcox Co.*

THOSE who have occasion to build articles of furniture; such as cupboards, work-tables and cabinets of various kinds, will be interested in the description given below. A departure from the methods used by many carpenters, will be noted particularly in the method of hang-

upon. The top and end sections are made entirely of wood but the back is a wood framework with panels of wallboard. Two inside shelves provide space for storing a large quantity of material. The stiles, top and bottom rails of the doors only are wood, the panels being made of one piece of wall-

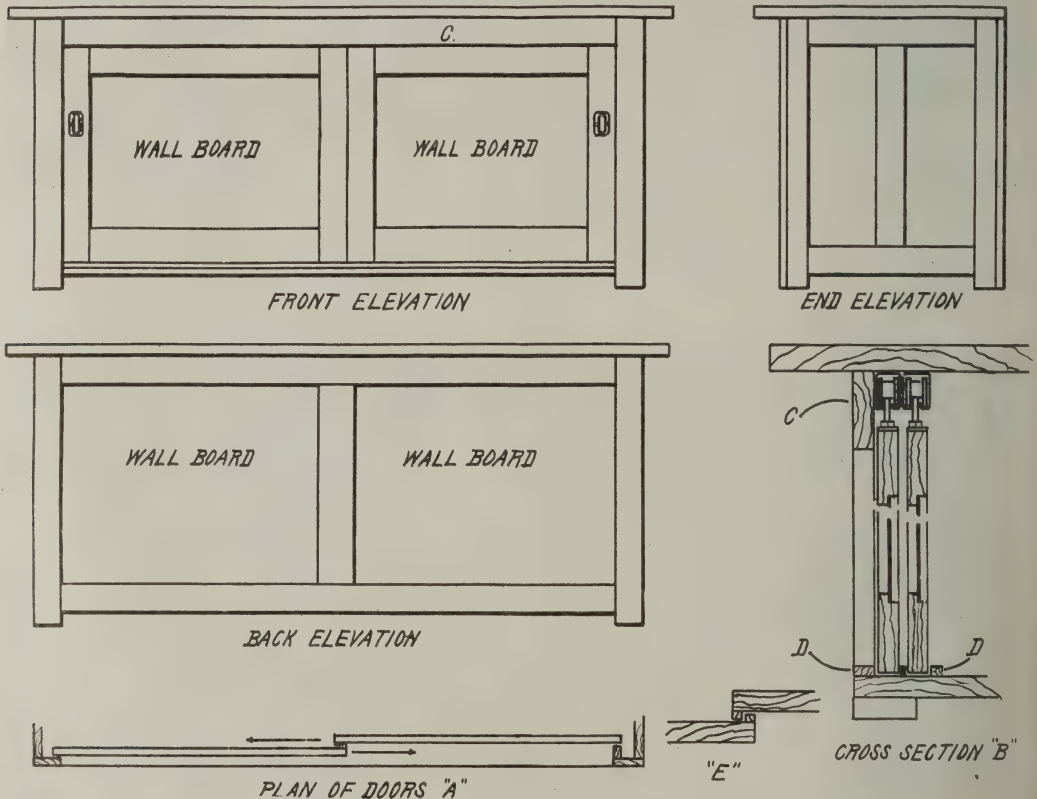


Figure 1

ing the doors and also in the construction of the doors and panels. While the articles described and their application are not entirely new, they are not as generally used for the purpose mentioned as their merits warrant.

The work-table shown in Figure 1 has two doors closing the entire front. The construction is clearly shown in the illustration and so it will not be necessary to enter into a detailed description, but a few points of special interest will be enlarged

board. A heavy stiff grade of wallboard is especially convenient for this purpose, as a panel of any size can be made of one piece without gluing or finishing of any kind. It is light in weight, holds its shape well and can be painted to give a pleasing effect, which harmonizes well with the finish of the woodwork. As an economy it takes precedence over any other material, not only in first cost of raw material but also in the saving of labor costs for constructing the doors and panels.

Special attention is directed to the method of handling the doors as shown in the plan "A" and the cross-section "B," Figure 1. The cross-section "B" is drawn to a larger scale. Sliding doors operating on two parallel tracks, take the place of doors hung on hinges as is the usual custom. The doors, of course, are very light and a small door hanger and track made especially for this purpose is used. The track is of the trolley or box-shaped type, about  $1\frac{3}{8}$  inches wide by  $1\frac{7}{8}$  inches high and it entirely encloses the track. A larger sketch of the hanger is shown in Figure 2. The wheels are made of either fibre or steel and have ball bearings which make a very easy operating device. Vertical adjustment as well as a slight lateral adjustment is provided so the correct alignment and proper working clearances may be easily obtained.

doors. A piece is attached to the side of each door where they meet at the center, as shown at "E," Figure 1. These strips overlap each other when the doors are closed,

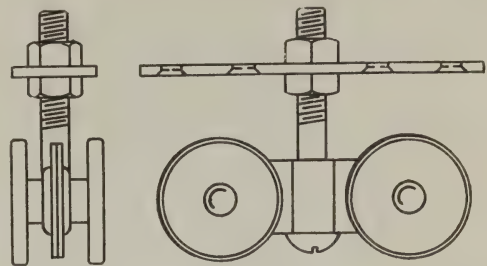


Figure 2

making a tight joint and at the same time allowing plenty of working clearance between the doors.

Half the front can be opened at any

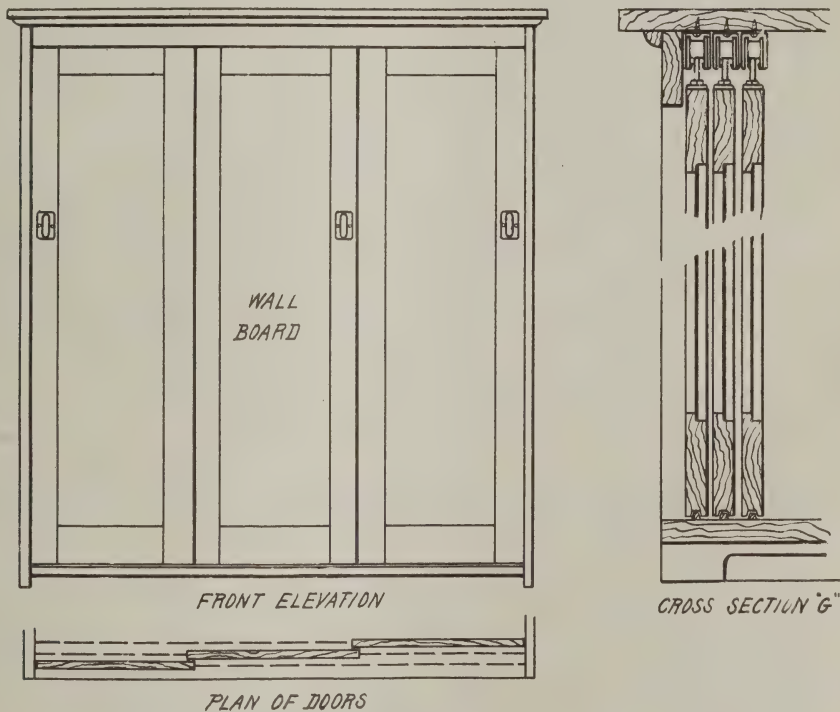


Figure 3

The track is screwed directly to the bottom of the table top. A facing strip "C" serves the triple purpose of reinforcing the table top and stiffening the entire structure, concealing the track and closing the space between the top of the doors and the bottom of the track. Narrow strips of wood "D" form guides for the bottom of the

time and this without swinging the doors out into the room. Any kind of swinging cupboard door is open to objections, though of course it must be admitted that the hinged door cannot always be eliminated; but these objections would be emphasized in doors as wide as the ones shown in this particular case. A door as wide in proportion to its



height as those shown in the illustration would be likely to sag, lose its shape and drag, if hung with hinges. On this particular point, the sliding door has a decided advantage, because of its being suspended from the top at two points, which does not cause any twisting or distortion of the door.

A second feature which should be considered is that if these doors were hinged, a little rough usage when the doors are opened, or someone accidentally running into them, would be almost certain to damage either the door itself or the hinge fastenings. The sliding doors never project into the room or expose themselves to acts of carelessness as mentioned above.

The third point is the ease of operation. Compare the long swinging movement necessary to open the hinged door, with the mere touch required to start the sliding doors with their ball-bearing hangers.

The convenience of making necessary adjustments can be named as a fourth advantage. When the swinging door begins to sag and scrape at the bottom, it becomes necessary to get a saw and plane to dress down the door; but with the sliding door, the adjustments (and these are seldom necessary after the initial adjustment when hanging the doors) only require the turning of a screw and all is well.

#### LOCKER WITH SLIDING DOORS.

Figure 3 illustrates a wardrobe constructed along the same general lines as the work-table. The panels of the doors and in

this case the entire back is constructed of wallboard. The doors sliding on three parallel tracks close the entire front. A plan of the doors is given at the bottom of the illustration referred to. Strips similar to those shown at "E," Figure 1, are attached to the overlapping stiles of the doors to make a tight joint. The stiles of the doors are  $\frac{7}{8}$ -inch thick, finished in golden oak, and the panels are painted to harmonize with the woodwork.

A horizontal cross-section of the doors, tracks and bottom guides, drawn to larger scale, is given at "G," Figure 3. The hangers and tracks are the same as previously referred to. The bottom guides are narrow strips of wood working in grooves ploughed in the bottom of the doors. Two-thirds of the front can be opened at any time. The doors slide easily and never extend into the room to interfere with anyone passing and do not occupy unnecessary space.

The two articles described have been in constant satisfactory use for a couple of years and are typical of a great many places where these little sliding door hangers can be used to good advantage. In offices especially, filing cabinets, shelving, card and circular cases as well as other articles of furniture, require light doors and in many cases the hinged door is really objectionable. For these sliding doors such as described above, will be found very satisfactory and the live wires among carpenters and cabinet makers doing a jobbing business will undoubtedly find occasion to make use of some of the suggestions offered.

## Give the People What They Want

**C**ONTRACTORS and builders are not generally classed as salesmen but that they come within that class will be readily admitted where a little thought is given to the subject.

Every contractor, builder or mechanic, must sell either his labor, the materials or the completed building. If labor alone is concerned then it must be dressed up and served in the best possible manner.

#### SELLING LABOR

Which man is hired first, other things being equal, the one neatly dressed and clean shaved, or the semi-hobo, with last week's growth of beard and three months'

crop of hair? Who stands the best show, the man who has made his reputation for doing good work, or the stranger who has only his union card to identify him? Who is put to work, the man with a full set of tools, worn down but in good condition, or the man who has to borrow a hammer before he can start work? Who gets the job, the man with a shovel on his shoulder or the one with his hands in his pockets?

Salesmanship goes down to the very lowest man, for even he tries to put on a bold front and tries to make a good appearance to sell his labor in competition with others. The best are selected, that is, the ones who

recognize the principles of good salesmanship and sell their labor accordingly.

But labor is a continuous sale. It is a sale every hour and every day, for when the quality lets down, the business is lost. When the man understands the means of keeping up the quality, keeping up the output, then his future is assured.

One sale leads to another. Just as one new and novel tool on a job leads to the sale of more, so the satisfactory completion of one day's work, or the work on one job, leads to employment elsewhere. Good men are kept track of and when they terminate their employment with one man, are snapped up by others who are in the market for services such as he can give. The good laborer or mechanic advertises himself in his everyday work, and unless his work is up to standard, or above it, he will become known for just what he is, in spite of his claims that he is as good a laborer or mechanic as any one else.

So, as laborer or mechanic, the man keeps up quality. If the standards of labor advance, and they are doing so every day, the man must advance also, or he will be passed by the men below him, and naturally drop a grade lower. Unless he studies, observes and learns, he cannot even keep up with the men in his class. For instance, a laborer may know nothing about building construction, but he learns to use a shovel and pick. As soon as he can do more work, or better work than his mates, he is made a subforeman. When he learns to mix concrete, with a shovel, how to tamp it in place, how to set reinforcing bars, etc., he has advanced, become more valuable to his employer, and has another talking point, which he can use in applying for more work. Instead of merely saying, "I want a job," he can say, "I can mix concrete." His chances improve with his knowledge, for every contractor is looking for more intelligent men. Even if he cannot find a job as foreman, he has unusual qualifications as a laborer. The higher steps are exactly the same, the man who has something to sell is rated according to his goods, his appearance, and his manner of offering his goods or services.

#### SELLING MATERIALS

There is not much difference between selling labor and selling materials. The salesman must have the best quality for the purpose, he must know his market and his customer. The quality is probably as well

known to the customer as to the salesman, and unless the salesman is a real salesman, the customer has the advantage of having used the goods. The contractor, for instance, knows the value of cement, lime, stone, patent plaster, yellow pine, cypress, hemlock, wall board, tar, pitch, asphalt, and a thousand other materials, from having used them, noting their peculiarities, good and bad qualities for various kinds of work, while the salesman is more concerned with the price alone.

When the contractor becomes the salesman for these materials, he has a fund of information to work from. He knows from experience when each should be used, and he can talk intelligently to his customers. He can, perhaps, show actual samples of the material in his office or shop or practical examples in place. Showing these goods, explaining their merits, and getting their use in the building is just as much salesmanship as selling an automobile by demonstration. This sort of salesmanship can be developed and made extremely valuable to the contractor, the builder and the carpenter, for it can be the means of closing contracts, securing work and even interesting lot owners in building.

#### HOW TO KNOW MATERIALS

There are two kinds of salesmanship, and they are closely related to the two kinds of advertising. One is Publicity, and the other is Direct Returns. The one gives out general information, so that the brand, the name or the nature of the goods is before everyone. The second closes the sale when the customer is in the market for that class of goods. Publicity Salesmanship never gets the contractor anything directly, but it puts him in touch with everything new, and with every possible customer. Suppose the contractor puts a Wall Board Play House in his show window. That is Publicity. Everyone sees it, but only those who stop and carefully examine it come in and ask the price, etc., are potential customers. The publicity will do much for the wall board but unless the contractor is prepared to follow it up with information regarding the Durability, Low Cost, Light Weight, etc., it will not make sales, and will not employ the contractor's men. There must be concrete evidence of the value of the material before many sales can be made. A door check in the show case does not appeal to anyone very long, but many of us



remember when the first doors were equipped with them. A large sign proclaimed, "Don't Close This Door, It Shuts Itself." Everyone stopped and watched it close, wondered why the wind didn't slam it or blow it open again.

The same with the first revolving door. People wanted a demonstration and walked around just to see how it worked. The contractor used it as a sample to install other doors. So in every phase of building. Everything new is quickly noted, and the contractor who installs or introduces it is known too. He is selling his services as well as the materials and should keep his name before the public as the exponent of new and good things, methods, etc.

#### PERMISSIBLE PUBLICITY

A part of the price of every piece of machinery is given to publicity and salesmanship. The contractor can and should devote part of his time to the purpose. His name should be in big letters on his shop, on his trucks, his machinery and apparatus. Suitable signs can be displayed on buildings under construction, both to advertise the contractor and to direct those who want to see the contractor of that building. The contractor who can, financially and constructively, turn the house or building over to the owner, has a right, and should exercise it, to let people know what he is doing, what he can do, and it is only salesmanship which will give him the full benefit of advertising.

#### SELLING BUILDINGS

The contractor should be posted on new things, new materials, new methods, new tools, machines and appliances. The fact that he is posted gives him a strong hold on the better class of work. Any Hottentot can build a shack, enough to keep the rain out perhaps, but it takes a scientific contractor with his wits about him all the time to build the Woolworth Tower. Any Indian can build a dug-out that will float, but it takes a naval constructor to design a battleship.

The architect of the Woolworth building made a study of high buildings. It wasn't his first. The contractor had studied the erection of other buildings. It wasn't his first contract. He obtained the contract because he convinced the owner and architect that he was skilled in that class of construction, and had built similar structures.

He capitalized his experience and reputation and practically sold the owner the building because of his salesmanship and reputation. The contractor should be posted on the materials which go into his buildings. As soon as he delegates any part to anyone, because he cannot take care of it, he loses that much prominence. It is so easy to be familiar with the best methods, etc., that one should keep up with the times. Catalogs are sent at the request of any one interested enough to ask for them. Liberal samples are readily obtainable. Machinery can be seen at work near every contractor, and every effort is made to disseminate knowledge, contractors compete only for the contract. They may keep some of their business methods to themselves, but the greater part of their work is carried on so openly that anyone can follow them. It must be remembered that the man who makes the first start is the one who generally keeps ahead.

So it is necessary to keep posted, and to let people know you are up on all new things. When a customer speaks of "Wall Board," for instance, be prepared to show him half a dozen kinds. Show the difference, and wherein each has good qualities. Nothing inspires confidence more than knowledge, and a reputation for general information helps a contractor more than he often realizes.

#### WHAT THE OWNER WANTS

Just as "a little knowledge is a dangerous thing" the contractor scents trouble when some people come to him. The contractor knows they are densely ignorant, but of course dares not let them know he suspects it. The contractor's safety is in having such a firmly fixed reputation that everyone will look up to him and have confidence in him.

The average owner wants a complete house or building. He doesn't want to dicker with the painter, the plumber, the electrician or anyone of the 57 trades on the building. So he consults the contractor and according as the contractor knows the details of all the trades so he will get along with the customer.

The owner wants something different from anyone else. Unless the contractor is prepared to show a variety of plans, styles, sizes and arrangements, he has a poor show. He must have plans for bungalows, houses, apartments. He must know about drug stores, banks and warehouses.

His knowledge must be first-hand and authentic.

After he secures the ideas of the owner, the contractor must convince him that he knows how to erect the building, that he can secure and will use the best materials, that he will hustle the job through and that his equipment is sufficient for the work. When hardwood floors are mentioned, the contractor should show his floor scraper, as his method of finishing floors, mention the power mixer in connection with concrete, the folding scaffold brackets to save scaffolding, the portable saw rig to save time on the job.

#### THE FINAL TEST

Closing the contract is not the last work of the contractor. In selling the house he must be able to please the owner, when the house is completed. The fact that the owner wanted twelve rooms when six would suit his family better is no excuse. The insistence of the owner for a high basement doesn't absolve the contractor in the least.

The payment is made when the house is completed, ready to move in, and unless the owner smiles when he takes the key, the contractor has slipped up somewhere.

Of course this means a lot of diplomacy. It means a lot of thought. It means a careful study of the entire subject by the contractor. It means able foresight rather than retrospect, and it means, if such a thing is possible, placing oneself in the owner's shoes during a large part of the time.

There are just as many contractors who go to extremes as owners. Where one of such inveigles an owner into building a larger or more expensive house than he can afford, he is only laying the foundation for a bunch of troubles. The real test of satisfaction comes, not when the plans are approved, not when the work is started, but when the owner moves in. Give him, if you can, what will please him then and you will have placed a standing advertisement of your ability as a salesman, and as a contractor.





# Interesting Examples of Wall Board



A Beaver Board Living Room



Interior of United Lutheran Church, At Lititz, Pa. Lined with Cell Board



Confectionery Store, Lined with Ceil Board



Beaver Board in Panel Designs



Badin, S. C.

Pierson & Goodrich, Architects  
Ceil Board Was Used On All the Walls and Ceilings in Every Building in This Town





When Times Are Dull, Carpenters Will Find Little Trouble in Transforming Unsightly Attics Into Pleasant Rooms with Wall Board



A Live Builder Recommended Wall Board for This Ceiling Which Used to Continually Crack and Fall



# The Chemical Closet and the Builder

Chas. F. Smith

THE present day tendency is toward sanitation. Sanitary appliances of all kinds meet with a ready sale, sanitary experts are in demand, and the public at large seems really awakening to the necessity of utilizing sanitary methods in the ordinary, every day affairs of life. Matters which, because they are ordinary and enter into our daily lives, are, in the great majority of cases, almost wholly neglected. The exclamation is so often heard, "Oh! that's good enough" applied to the privy vault, or to the well in dangerous prox-

imity—how he clarified the atmosphere of minute dust particles, and other disease breeding matter, in his passage through the air, which he proceeded to scrape from his body and legs on alighting anywhere, and greedily devoured. The well-meaning doctor did not go far enough in his analysis to realize, as we all do now, that the fly is one of the greatest pests to humanity, that it thrives best and breeds easiest in the vilest carrion and filth, from which it readily conveys germs of vile and deadly diseases to human beings. The privy furnishes an ex-

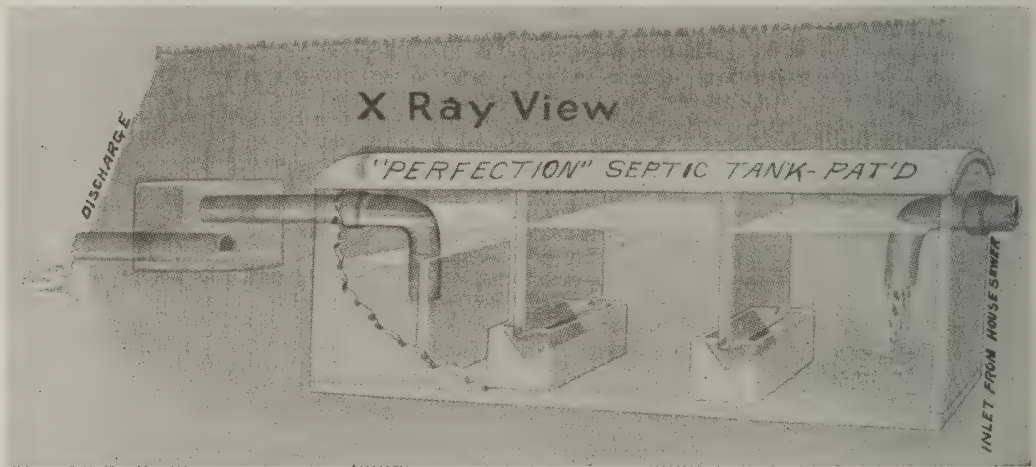


Fig. 1. A Septic Tank

imity to it, to the cesspool, to the open manure pit, or perhaps an unvented and untrapped plumbing fixture in the house; and yet all, or any one of these, are of the utmost importance to the health and life, not alone of the residents of the particular premises, but to the entire community; one touch of leaven affects the whole batch of dough, and so one unsanitary privy can poison the town, not only by the seepage which may affect neighboring wells, but by the disease germs conveyed, perhaps for miles, by the pest-carrying house fly. The germ theory of disease is not so very old. The writer well remembers, when a boy, of reading an illuminating article by a learned doctor—long since dead—of the advantages to humanity of the common house-

cellent hatchery for these pests, a better one could hardly be devised, and yet they are quite common in many localities, particularly in suburban or country districts, and at the various vacation resorts; and they are also frequently found even in some of the larger cities where the so-called "odorless excavators" are engaged to clean them out at intervals.

The germs of typhoid fever are taken into the human system through the mouth, in the food or drink, substances always easily infected, and it is quite likely, therefore, that typhoid fever is one of our most prevalent germ diseases. In fact, it is doubtful if there is anywhere in this country a community of more than twenty families without at least one case of typhoid

during the year; and the number of cases among returning vacationists during the summer and early fall is simply appalling. There can be no question whatever but that the entire elimination of the privy would

Government is taking steps to prevent the construction of any more sewers which will discharge untreated sewage into these waters; so it is becoming more evident daily that our present sewerage system is far from being an unmixed blessing, and the time cannot be far distant when a radical change must be made.

In the suburban localities where running water may be provided in the house, the septic tank would seem very desirable; such for instance as the one illustrated herewith, in which the sewage, by the aid of bacteria always present in such matter, is changed to a fluid, and the discharge becomes harmless, chemically pure water. In these tanks no chemicals of any kind are used, the results being attained entirely by the natural bacterial process. Here, surely, is an opportunity for the contractor or builder to reap a golden harvest and confer a blessing upon his patrons. The system is not expensive, requires no attention, and is very readily installed; the complete sections are furnished by the manufacturers, ready to assemble with the addition of a little cement mortar. It is distinctly a builder's job, and one that will, when completed, be a credit to the builder, and last as long as the house. It is certainly preferable to the street sewer, and is absolutely sanitary in every respect;

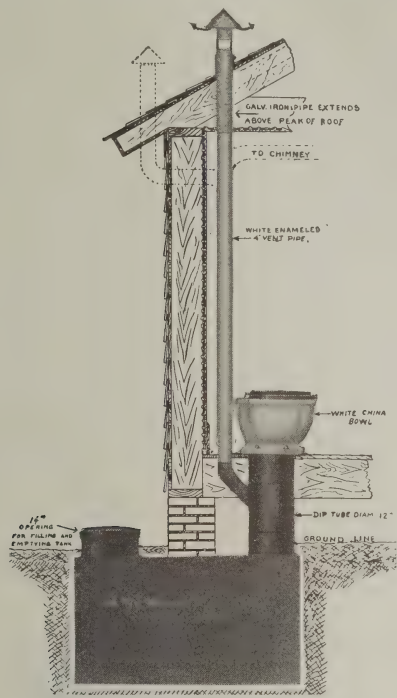


Fig. 2. Tank Form Chemical Closet

very greatly relieve this deplorable condition.

All thinking individuals recognize that because of peculiarities in human nature, certain conditions tend to demoralization and immorality, particularly among the youth, and of both sexes; we cannot close our eyes to it; and the usual privy of the country school or church, or other public or semi-public building, furnishes one of the most prevalent conditions; another cogent reason for its elimination.

One may well ask what is to take its place. In the rural and suburban districts the public sewer is not available, and even where it is it leaves very much to be desired; for, although it furnishes at present a ready means for the disposal of our house sewage, it is rapidly becoming a menace to the public health through the pollution of our inland streams and coastal harbors. Already the board of health has found it necessary to prohibit all bathing in the waters of the harbor of New York City because of such pollution, and the Federal

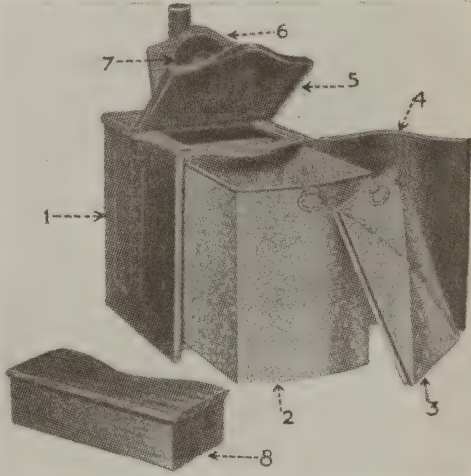


Fig. 3. Cabinet Form Chemical Closet

no wells can be polluted by it, no flies can reach it, and no noxious odors can emanate from it. It does, however, require a certain amount of water, such an amount as would be used ordinarily with a water closet, and



the kitchen and basin wastes should also be discharged into it, but not the roof leaders. Steel tanks are also manufactured for this same purpose.

While the above system does not, in real-

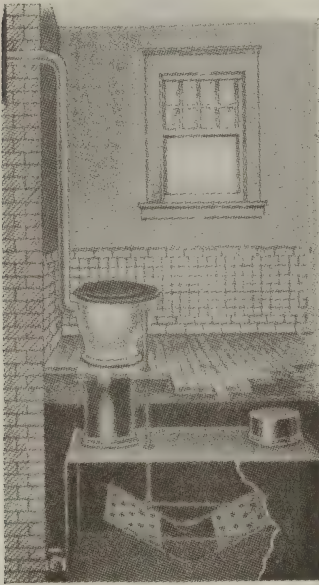


Fig. 4. Tank Form Chemical Closet

ity, comprise a chemical closet, it seems proper to classify it in the same category as being entirely separate from the public sewer. In some cities, few, if any, however, in this country, the sewerage system is kept entirely separate and distinct from the rain or waste water systems; the sewage being led to extensive tanks and filter beds, while the waste water is led directly to a stream, lake, or other large body of water. All this, of course, does very nicely for the large town or city, where the enormous expense involved may be borne by a large community, and where an abundant supply of running water is available; but there are thousands of other cases, in fact, it is safe to say hundreds of thousands of cases, of isolated houses or small communities where running water is not available, and where the chemical closet is the only safe expedient for the collection of the human excreta; in fact, there are many summer shore resorts where running water is available in the cottages and hotels, where the septic tank or the chemical closet would be far preferable to the present method of

discharging the sewage through separate pipes from each building into the water, to be thrown back later upon the shore, to the disgust of strollers and bathers.

The chemical closet consists essentially of a metal, or other impervious receptacle, containing a chemical which disintegrates and deodorizes the excreta, rendering it entirely harmless. The receptacle, in all cases, is provided with a tightly fitting cover and a vent pipe, which may be connected either with a chimney or carried through the roof to a point above the ridge.

There are two general forms of closet, one having a tank of considerable size, shown in Figure 2, which necessarily limits the location of the closet bowl to the first floor, and the other having the receptacle in a container which enables it to be located in any room on any floor of the building, as in Figure 3. The tank form, having a greater capacity, does not require such frequent attention as the pail form, but it is natural-

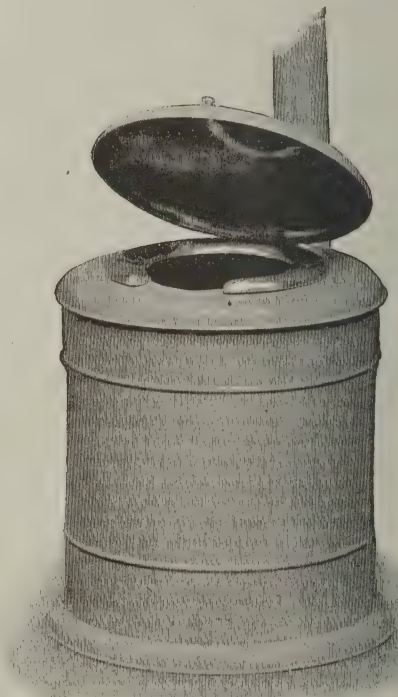


Fig. 5. Cabinet Form Chemical Closet

ly somewhat more expensive to install. One of the tanks is shown in Figure 4, having a so-called agitator, which is claimed to be an improvement, as it helps to disintegrate the fecal matter. The pail or cabinet form, as in Figure 5, being of small capacity, re-

quires no such adjunct. In either case, the contents, when removed, may be either buried or used as fertilizer. The Chinese are wise, in this respect at least, for they have learned from the experience of many centuries to conserve all their resources; nothing is wasted there; hence, if you visit the most modern building in their largest cities you will find receptacles for human excreta, which, after having been used by any one, are at once removed and emptied into a special tank, which at intervals is cleaned out, and the contents invariably used for fertilizing. No chemicals are used in the process, as they know little of disinfectants, and would probably consider their use unnecessary when such prompt attention is given to the matter, and the labor cost is practically nothing. However, that system in its entirety would not be satisfactory with us.

The septic tank system and the chemical closets, as described in outline above, are absolutely sanitary, and meet all the requirements of the boards of health, and no doubt would be very generally installed if owners were made acquainted with the advantages and the low cost of installation

and operation; but in that respect at least, builders and contractors are rather deficient; they do not keep themselves thoroughly posted on such matters, and consequently cannot advise with the owners on the desirability of the chemical closet as opposed to the privy; and yet, as a matter of fact, the most expensive septic tank or chemical closet costs but very little more to install than the unsanitary privy of usual construction, while the advantages of the chemical closet are beyond all comparison with the privy; the latter has everything to condemn it, the former everything to commend it.

To a great extent the survival of the privy rests with the builder; there is good profit for him in its elimination and the substitution of the chemical closet or septic tank.

There are at least three or four different manufacturers in the market who will be glad to make satisfactory terms with any builder who will undertake the installation of their apparatus, and the benefit to the community at large by the removal of the unsightly and unsanitary privy is alone worth all the effort.

## Decoration of Wall Board

SOME ONE has defined architecture as the art of covering one substance with another, to represent a third, which if used, would be undesirable. Whether or not we agree with this definition, there is no doubt but that a large part of modern building is given to covering the original material to hide its identity and to imitate something which was used at one time, but is now out of use for any one of a hundred reasons.

A great many have never gotten over the Stone Age, when the walls were sculptured to represent the pastimes of the day, but our present day tendency is not long enough to make our decorations permanent. The stone walls of the original caves succeeded by stone walls of early buildings, were in turn replaced with plaster and wood and now are turning to Wall Board, made of wood, to take the place of plaster, and serve the same purpose as the stone walls of our ancestors.

How to decorate Wall Board is a question which came up as soon as the material became known. Of course it could stand

for itself without any decoration whatever, especially when one of the brands with a finished surface is used. Again there is a desire for something different, either in the various rooms or in neighboring buildings. Surface, color and texture can be furnished at the mill, and it is only when some departure from the stock patterns and colors is desired that the subject of decoration is brought up.

Wall Board, as generally made, is a sheet of manufactured lumber, and so free from the defects of natural lumber, such as knots, bark splits, etc. It will not shrink and swell with the varying moods of the weather, but still must be protected from rain and snow. For exterior use it can be painted exactly like wood, while for interior use its limitation is only the taste and touch of the painter or home owner. We will, in this article mention only the possibilities of the material, leaving the technical operation to a later issue.

Modern building conditions require a surface as a background capable of being painted or decorated in a variety of ways. The



texture is not so important as the demand for a uniform level surface. Some Wall Board has a stippled surface and if other textures are found desirable, there is no doubt but that the manufacturers will supply them. The painter has therefore an ideal surface to start with and can provide any desired finish.

#### COLD WATER PAINTS

One of the most satisfactory finishes for Wall Board is "Cold-Water Paint." This requires only mixing with water to make a paint of any desired shade or color, while there are advantages as regards cost, ease of application, etc. Not the least is the fact that stencils can be readily made or purchased, so borders, friezes, cornices, etc., can be added where desired. Indeed some of the paint companies have elaborate catalogs of stencils, center pieces and other decorations, particularly adapted to cold water paint on Wall Board.

Cold water paints are readily applied by the home owner, and so can be used by those who wish to redecorate every year on account of variety, as well as the novelty of having one's own handiwork in evidence. And why should it not be so? Elaborate lace curtains are being replaced by home made ones, built-at-home furniture is more than a fad. Woodwork, floors, trim, etc., are stained and finished as we wish and so why should we not employ like means to finish the walls?

#### OIL PAINTS

Oil paints, especially when given a dull finish, prove extremely desirable on Wall

Board. This is due largely to the permanent nature of the materials. The Wall Board containing no chemical will not alter the color of the most delicate pigment nor need special preparation before applying. The porous nature of the surface insures against peeling or flaking, so that additional coats, or changes in the decoration do not require scraping, burning or other expensive methods of preparation.

Harmony in detail and color is necessary in all the interior furnishings. This can readily be obtained with Wall Board for it can be used as desired and colored to suit. When the wall or ceilings are beamed or paneled, the Wall Board makes the ideal surface, as there is no danger of cracking it when putting up the woodwork.

A great many are concerned with results only, overlooking the means by which results are obtained. Color and form count for more than materials. Here is where the contractor can achieve the best results with the minimum effort. With any of the methods of finishing, Wall Board is a satisfactory base and by the use of a little care in selection, the contractor can prepare samples showing the great variety of finishes, decorations etc. These samples can be used, as a basis for finishing work in place or for securing new work.

When one considers the number of buildings in which Wall Board can be used to advantage, the value of having samples to show the natural surfaces as well as possible finishes is apparent to every one. Suppose we try a lot of panels in our shop window and see what the people think of them.

Where a contractor and builder has breached his contract by minor and slight omissions, deviations, and defects in the construction of a building when tested by the terms of the contract, the owner's measure of damages, under section 2620, St. 1890 (section 2852, Rev. Laws 1910), is such an amount as will compensate him for all the detriment proximately caused thereby, or which, in the ordinary course of things, would be likely to result therefrom; but the form in which this measure is expressed or the rule by which it is made may be changed to adapt it to the facts in the case on trial, as illustrated in the body of the opinion; and, where the facts warrant it, it is not error to instruct that such measure is the difference be-

tween the value of parts not so constructed and the same parts if they had been constructed as required by the contract.—*Wiebener v. Peoples*, 142 P. (Okla.) 1036.

Since the statute giving a right to a mechanic's lien was not intended to abridge the parties' right of contract, and where the contract waives the right to a lien, or is of such a character that no right can accrue thereunder, then the Mechanic's Lien Law (Hurd's Rev. St. 1913, c. 82), especially section 21, attempting to confer a right to a lien on a subcontractor in spite of such an agreement between the parties, is unconstitutional and void.—*Rittenhouse & Embree Company v. Warren Construction Company*, 106 N. E. (Ill.) 466.

# The One Man Shop

Chas. Cloukey

Fourth Article

THE making of sash and check-rail windows on the variety saw with the attachments mentioned in the previous articles, will call for but one additional tool and that is a cutter head something like that shown in Figure 2.

The cutter should be not less than 10 inches in diameter in order to reach up through the saw table far enough to make the cut at *d* in Figure 1. And the same is true of dado heads, thick saws, and any cir-

cular cutters liable to be needed in connection with the machine.

When handling the sash stock on end in order to make the slots and copes it is best to make a good sized block, say about 3 inches thick and 4 inches high and 8 inches long with a place in one end to fit the moulded side of the stock and a place in the other end to fit the square side. This will enable the workman to hold the work firmly and move it across the cutterhead without

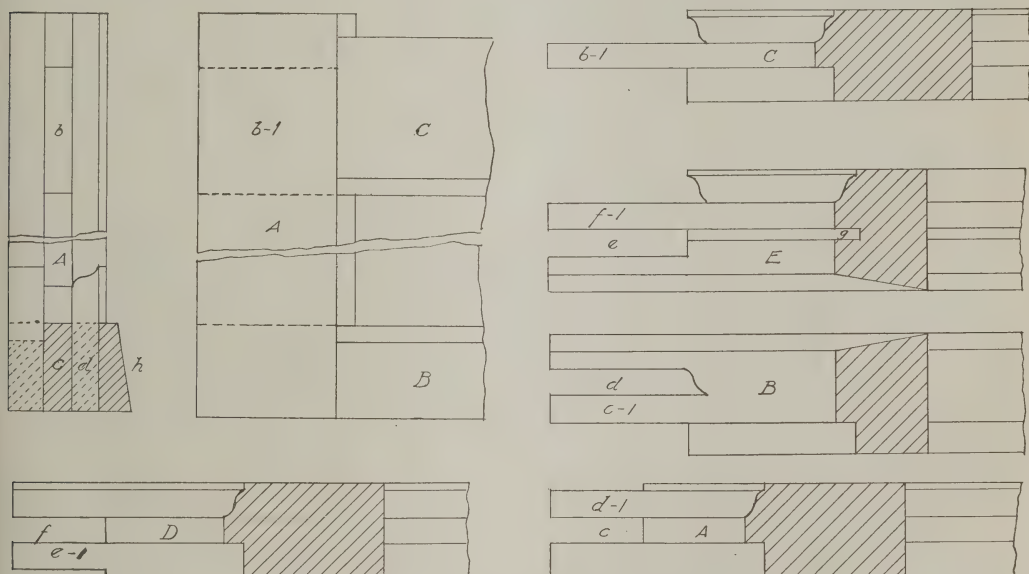


Figure 1

cular cutters liable to be needed in connection with the machine.

It would be rather likely that the carpenter buying a variety saw would not buy the extra cutter heads before setting up his machine and trying it out. In this case he would be able to measure up from the center of the arbor or saw shaft to the top of the table when the table was the lowest and thus know how small a cutter head he could use.

As we said before, these extra cutter heads should be used with wooden throats in the table of the machine, and let the cutter head cut its own way through the false

tipping or wobbling and also protect the hands from the cutters.

Here let me again warn the workman to be sure and push the stock and the block clear of the saw every time before he lets up on it or tries to slide it away from the fence. Eternal vigilance is the price of fingers.

For making the mouldings on the sash as shown in the sections at A, B, C and D, the shop man should buy a milled cutter which can be bought from almost any knife concern, and indeed he should get it from the same people who furnish his cope cutter as indicated in Figure 2. As these two



cutters must work together to make a fitting joint, procuring them from the same concern would insure them to be right.

The milled cutter is made like an ordinary sticker knife except that the pattern is shaped or milled on one side and will always keep the proper profile as it is sharpened only by filing straight across on the same bevel it has when new. The circular cutter already illustrated is also a milled cutter and should never be filed or whetted on the shaped side.

Referring again to Figure 1, we will consider A as the upper stile or side piece of a check-rail window, B as the upper check and C as the top rail or cross piece.

B shows the mortise in the stile and B-1 the tenon on the rail which must fit into the mortise. The system followed in marking the different parts of Figure 1, is to mark the slot or mortise with a letter and the tenon with the same letter—1.

It is a fact that most men have trouble to remember just how the cuts go in the checks of windows even after they have had a good deal of experience with them, and my advice to a beginner is to send to some sash and door factory and get a standard open window of some moderate size, say 24x30, 2 light 1½, one window 10x24, 4 lt., one window 10x14, 8 lt., and one window 10x12, 12 lt, or any other sizes he may choose, but the idea is for him to have these standard sizes and layouts so that he can take them apart and use them for patterns and put them together again and become accustomed to the way the pieces look when they are off by themselves.

I have given the four different kinds of windows because they are laid out differently, and although the carpenter may have fitted and hung hundreds of them, the chances are that he will not be able to lay out the cuts on them even after studying the drawings which accompany this article. And indeed this was not intended to be a treatise on making windows, but to show that they could be made on the one-man machine and with greater facility than making them by hand or waiting too long to get them from some factory.

It does not stand to reason that a man could make windows in this manner in successful competition with a regular factory, but the knowledge that he can make windows any day and deliver them the next should be the means of getting the job car-

penter a good many hurry-up jobs in the face of ordinary competition.

A word about lumber for sash might not be amiss as it will be necessary for the carpenter to buy his lumber dressed. Therefore he should have on hand a reasonable quantity of 1½ white pine, surfaced two sides, as this is a stock he may not be able to find in the common run of lumber yards.

It will be seen from Figure 1 that the stiles, rails and checks are all made from the same thickness of lumber which is a great saving in time and enables one to work the lumber up closer also.

The boring for the knot of the sash cord

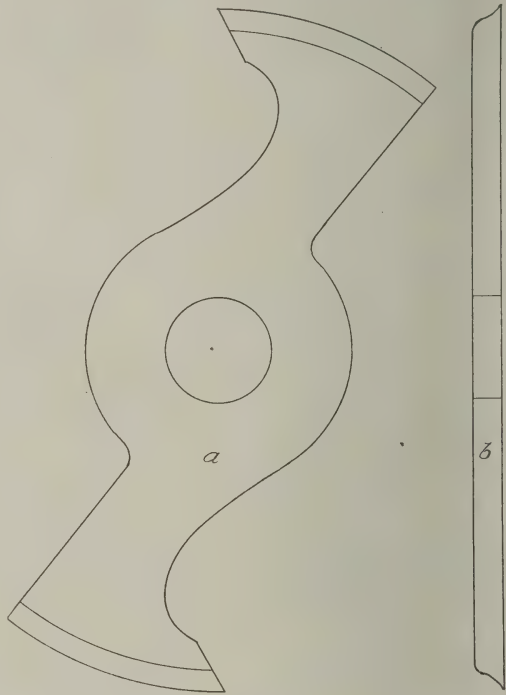


Figure 2

can be done on the boring machine side of the saw, but if there are but a few windows they can likely be bored quicker by hand than to change the machine.

The groove for the cord can be made with the grooving head or the thick saw, or it can be made with the regular saw by making enough cuts to get the required width.

Sash are generally clamped up tight and then pinned with metal sash dowels. If these are not available they can be made by cutting off the ends of nails to the required length.

(To be continued.)

# Some Steel Square Notes

Figure 40 exhibits the operation of finding the angles to mitre an acute angle, when the run of the sides and the angle of elevation are unequal. Draw the acute angle A;

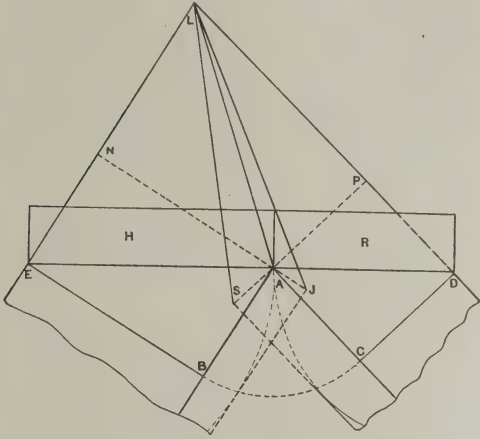


Figure 40

set off from A to B and C, equal to rise of the sides; square over from B and C equal the run of the sides; joint A'E and A D equal the width of the sides; from the points E and D as centers, describe arcs from the point A; tangent to the arcs, and parallel to A B and A C, draw the dotted

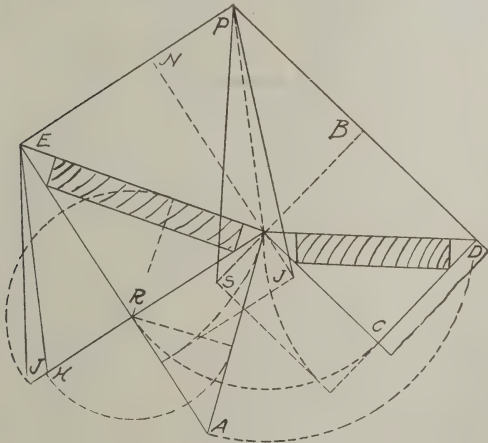


Figure 41

lines to the points S and J; join L S and L J. Then E L J equals the angle to cut the side and edge of the piece H; P L S equals the angle to cut the side; and E L A

equals the angle to cut the edge of the piece R.

By the use of the square. Place the square on the side and edge of the piece H, with N L on the tongue, and N J on the blade; mark from the tongue for the cuts required. Place the squares on the side of the piece R, with P L on the blade and P S on the tongue, mark from the blade. Place the square on the edge, with N L on the tongue and N A on the blade; mark from the tongue for the cut required.

Figure 41 exhibits the operation of finding the angles to mitre the sides to an obtuse angle, when of unequal width, placed oblique to the base.

Set off from L to R and C, equal the rise; from R to E and C to D equal the runs;

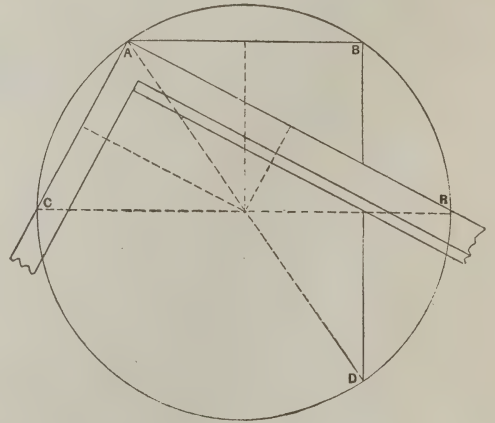


Figure 42

join L E and L D, the widths of the sides. From the points E and D as centers, describe arcs from the point L; tangent to the arcs, draw parallel to L R and L C, cutting the dotted lines from N and B at S and J; join P S and P J. Then N P L equals the angle to cut the side E L, and B P S equals the angle to cut the side D L.

To find the angles to cut the edges: Extend E R and L R; from the point L as center, describe arcs from the tangents L E and L A, cutting L R at J and H; join E J and E H. Then E J R equals the angle to cut the edge D L, and E H R equals the angle to cut the edge E L.

By the use of the square. Place the square on the side E L, with N P on the



tongue and N J on the blade; mark from the tongue. Place the square on the edge, with R H on the tongue and R E on the blade; mark from the tongue for the cut required. Place the square on the side D L, with B P on the tongue and B S on the blade; mark from the blade. Place the square on the edge, with R J on the tongue and R E on the blade; mark from the tongue for the cuts required.

To bisect a right angle, place the square on the side with equal distances on the blade and tongue; mark from the square for the line required.

Figure 42 exhibits the operation of bisecting a circle and also of finding the center.

By the use of the square. To bisect the circle: Place the square on the circle, with the heel at the point A; mark from

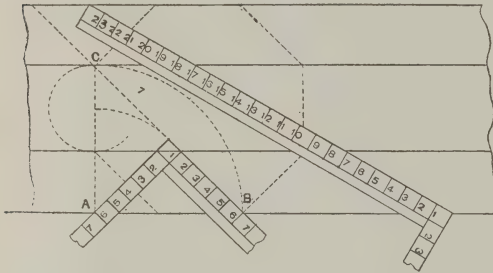


Figure 43

the blade and tongue, cutting the circle at C and R, the points required.

To find the center of the circle: Place the heel at the points A and B; mark from the blade and tongue, cutting the circle in C R and A D; join the points for the center required. Or, bisect the blade and tongue, and the chord A B; square up from the points for the center required.

Figure 43 exhibits the operation of eight-squaring a piece of timber 12x12 inches.

To find the point to gauge for the angle to be removed: Place the square, with half the width of the piece on the blade and tongue. Then the diagonal A B equals the side of the octagon plus the distance to gauge for the piece to be removed; from the point A as center, describe the arc from B to C, the point required.

By calculation:  $6 \times 6 = 36 + 36 = 72$ ,  $\sqrt{72} = 8.484$  inches, from 12 inches = 3.515 inches, the distance to gauge for the parts to be removed.  $8.485 \text{ in.} - 3.515 \text{ in.} = 4.97 \text{ in.}$ , the width of the sides.  $4.97 \text{ in.} + 3.515 \text{ in.} = 12 \text{ in.}$ , the width of the

piece. Another method of finding the point to gauge for the piece to be removed is to place 24 inches or 17 inches on the piece, and gauge from the points 7 and 17, or 5 and 12, which is not exact, as it gives the width of the sides equal 5 inches, and the piece to be removed equal  $3\frac{1}{2}$  inches,

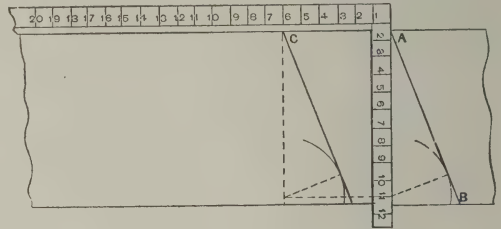


Figure 44

but for convenience it is near enough for all practical purposes.

Figure 44 exhibits the operation of transferring angles.

By the use of the square. To transfer the angle A to C: From the point 11 on the tongue as center, describe an arc from the line A B; move the square to the point C, and repeat the operation; tangent to the arc, draw to the point C for the cut required.

Figure 45 exhibits the operation of finding the diameter of three equal circles, inscribed in a given circle.

From the point D as center, with D J as radius, describe an arc, cutting the circle at R; join R J. From the points D and J as centers with half the length of D J as radius, describe arcs cutting the line from D at P, and J B C; join P C, cutting J R

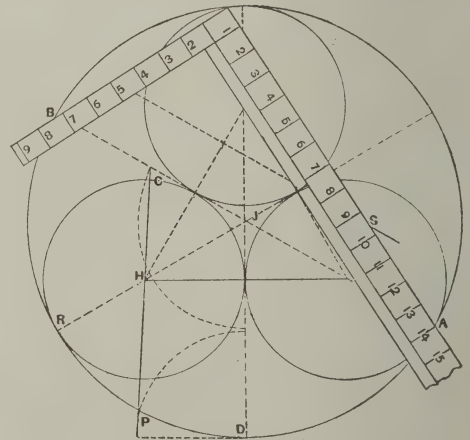


Figure 45

at H: then R H equals the radius of the circles required.





of yours have simply forgotten you, because other fellows have come in and made so much noise about themselves. One of the first things I learned when I went on the road as a salesman was that people have a very short memory. They soon forget you are in existence if you don't let them know you are around."

Tom paused awhile to let this sink in and then resumed. "Another thing, dad, you do business in the very same way they did before Noah built the ark—you wait for business to come to you. Why, I couldn't hold my job as a salesman a week if I only sold people who sought me out. It's my business to seek them out."

"But what on earth, boy, would be the good of my going around hunting up business?" objected the father. "People will only build, remodel or repair when they are good and ready."

"All wrong!" cried Tom. "Fully two-thirds of all commodities that are sold are bought by the people who never intended to buy them, till they were persuaded to do so, or had their desires awakened by seeing the article on display or owned by some one else. Barring the barest necessities of life, people don't want to buy hardly anything. That is, they don't want to part with money, and that is where salesmanship comes in and salesmanship makes business. There's plenty of wealth in every community, plenty of money deposited in the banks, and it is the salesman who gets people to spend some of this surplus money, and so keep all the wheels going round."

"I don't see how this applies to me," said Mr. Foster.

"It applies right here," said his son. "You've got to advertise. You've got to get into the newspapers and let people know that you are not in the cemetery yet with

wreaths on your grave. You've got to go right after them and get them to cut loose from some of their surplus wealth. You must not wait until a man wants to spend his money. You must make him spend it by proving to him that it is to his advantage to have a new house or a new roof or a new porch or a new barn. There's plenty of business, dad, only you've got to dig it up. There's plenty of money that can't circulate till you pry people loose from it."

The older man shook his head in a gesture of despair. "Tom," he said, "it's no good. It's just as you say—I'm a mechanic, not a salesman. I can build anything from a chicken-coop to a church, but I'm not a drummer and it's too late to make me over again."

"All right, dad," flashed back Tom. "You're the mechanic and I'm the drummer. Let's form a partnership. I've saved up a tidy sum in the last five years. You say your business is busted anyhow. Well, I will meet your obligations, for which you can give me your note. Then I will advance the necessary capital and I will drum up business, while you devote your time to the construction end. Of course, I must have an entirely free hand. The profits we will divide equally. But I want you to agree to a partnership for three years. Is it a go, dad?"

"I should say not!" cried his father, indignantly. "Do you think I'm going to rob you of your money in that way?" and he stalked out of the room.

But Tom had not been a traveling salesman for five years for nothing. First he got his mother on his side and then mother and son both laid siege to father, till at last he yielded to his son's proposition, though with ill grace.

(To be continued.)

A contractor had a contract to build a schoolhouse. He subcontracted a part of the work. A material man proposed to furnish materials to the subcontractor. The contractor agreed in writing to pay the material man for such materials "when the work on the schoolhouse is completed." The subcontractor did not complete his work. *Held*, that such agreement constituted no obligation to pay, except out of moneys earned by the subcontractor.—*Meurer v. Kilgus*, 90 A. (N. J.) 1011.

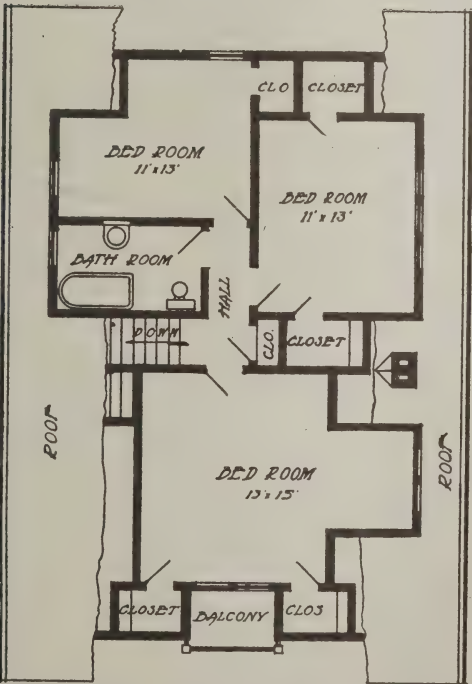
A finding that a building contractor "abandoned his contract" was a finding that the abandonment was the result of the contractor's own act and volition.—*Lynip v. Alturas School District of Modoc County*, 141 P (Cal.) 835.

Where, at the request of the owner, the plans for a building were changed after the contract was let, the architect is entitled to recover for labor in making the changes.—*Johnson v. O'Neill*, 148 N. W. (Mich.) 364.

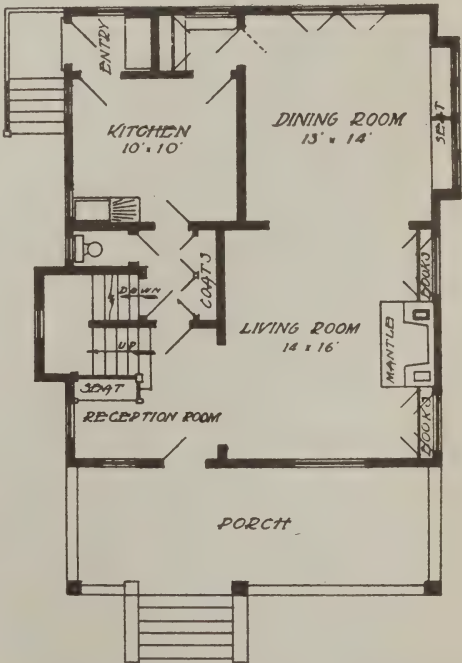


A Convenient House.

Burd F. Miller, Architect



SECOND FLOOR PLAN



FIRST FLOOR PLAN



# The Casement Window

*E. Miller*

CASEMENT windows, which have come into quite general use in this country, and, until quite recently, were thought to be impracticable, have been used in Europe for many years. In connection with our climate they were not considered storm-proof, and, in fact, many methods of construction have so proved themselves. This is due to two reasons, incorrect construction and careless fitting. The natural tendency of the material composing the sash and frame to go and come with atmosphere changes has caused many casements to become either so loose as not to withstand the weather or so tight as to be impossible to open with ease.

Nevertheless, owners who wish the best of everything in their homes demand casement windows. The chief reason for this is that the ventilating facilities of the casement are ideal, the entire window may be opened which is impossible with double-hung windows. Another reason is that the ease with which in-swinging casements may be cleaned presents a powerful argument to every housewife who wishes to save herself as much subsequent labor as possible.

Casements constructed of metal have been used for a great many years, even as far back as the fourteenth century, and time has proved their practicability. There are several manufacturers who make metal casements and, as far as I know, they are all reliable and scientific in construction. The main argument against metal casements is their initial cost.

But this article is concerned not with metal, but with wood casements, casements that can be made in any lumber mill and fitted by any competent carpenter.

There are two kinds of casement windows in use today, those the sash of which swing in, and those in which the sash swing out. Both types have enthusiastic champions.

Casement windows swinging out are, I think, more generally used than those swinging in. The reason for this is that the in-swinging casement is commonly supposed to be much more difficult to make water-tight than the out-swinging casement, and, in fact, it is even considered by many

impossible to make an in-swinging casement sash storm-proof. Although it is true that the in-swinging type of casements is more difficult to construct properly, it is entirely erroneous to suppose that it is impossible. Casement sashes swinging in are just as practical as casements swinging out when constructed carefully and correctly.

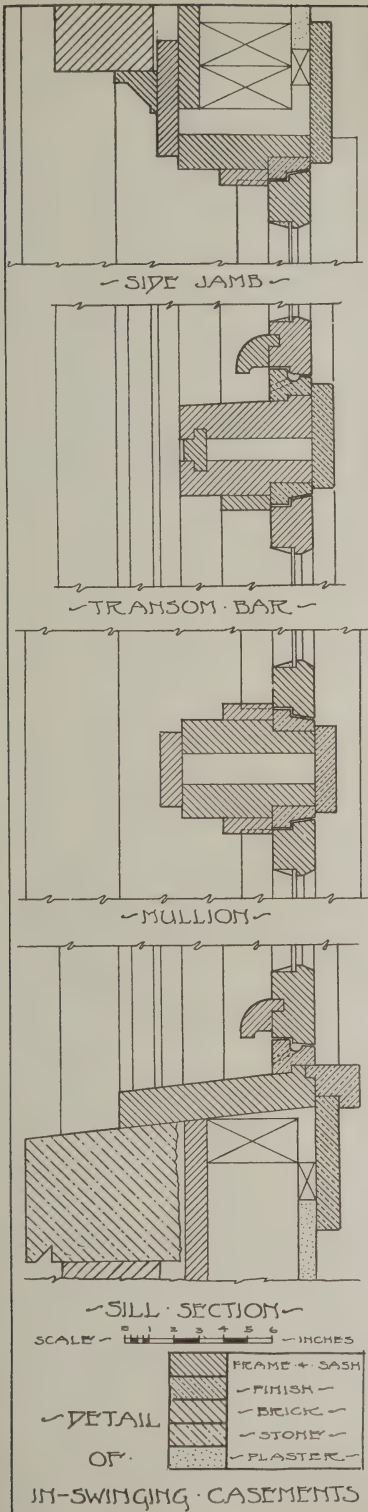
The disadvantages of out-swinging casements are many. When open, they are exposed to all the forces of the elements, summer showers will wet them inside as well as out and high winds have been frequently known to tear them from their hinges. Then besides, out-swinging casements are extremely difficult to clean, it being well-nigh impossible to clean them with ease and efficiency.

But the biggest problem in this construction is a satisfactory method of screening them, inside screens being the only practicable solution, and this is undesirable both from an artistic as well as a utilitarian point of view. There is a device on the market for manipulating casements without removing the inside screen and which is operated by a knob or lever set into the window stool. The main objection to this arrangement is that, since the apparatus secures the sash only at the bottom, if the sash is a high one it is bound to warp out at the top as time goes by and soon becomes both misshapen and ill-fitting.

In-swinging casements have, I believe, none of these faults. They may be screened outside just as well as double-hung windows; when open they are swung inside, safe from the elements, and their accessibility for cleaning is ideal.

The argument is often brought forward that casements swinging in are difficult to drape. In point of fact, they can be provided with draperies just as easily and artistically as either double-hung windows or casements swinging out.

There are two methods of doing this, the most satisfactory being to have the hanging attached to a curtain rod and be fitted with decorative pull cords and tassels, so arranged that when one of the cords is pulled the draperies are folded together closely at the side of the window, the other cord closes



them again. Some owners seem to prefer the crane method. Cranes, on the same principle as those used in old fashioned fireplaces, to which the hangings are attached, are hinged at each side of the opening. When it is desired to open a window the draperies, together with the crane, are swung entirely out of the opening and folded back against the wall. This method seems more clumsy than the first but it is preferable with heavier hangings, since it does not wrinkle them or cause them to lose their fresh appearance as the other method might be apt to do.

Some writers are prone to belittle casement windows and pass them by simply with the remark that they are impractical. One author whom I have read disposed of the subject of casement windows very expeditiously. He stated that on one occasion, in the rural district, sleeping in a ground floor bedroom, in order to obtain proper ventilation he was forced to expose himself to the mercy of any night prowlers, either two or four-legged, who might take a notion to outrage his privacy. Whether this writer had ever or not heard of transom cash is an unsolved mystery in my mind. In bedrooms, especially, I recommend the use of transom sash, in fact, it is preferable to have them in connection with all the windows.

The transom sash should be hinged at the bottom and held in place by a chain, never hinged at the side. I came in contact with a case at one time where the owner, against the advice of his architects, insisted upon having the sash hinged at the side. The result was that he very soon found to his disappointment that the maid-servants, standing on a chair to wash the transoms, would throw one arm up over the sash, and as the height of the sash was so small in proportion to the width, the leverage was too great, and soon the sash began to sag out of their proper position and were both unsightly and difficult to manipulate.

What I consider one of the best details that I know of for in-swinging casements is shown in the accompanying figure, which, I think, explains itself. The detail is typical, showing the frame placed in a brick veneer wall.

The point of superiority of this construction over many is that the beveled strip which receives the sash is a part of the finish; it is not put in place until the building is plastered and dry. This is the important point. The sill section of this strip, as it is shown, has a semi-circular groove running its entire length which is connected with the outside by a hole bored at the center of the window as shown by the dotted lines. The water table is set up high enough to clear the strip when the sash is swung inside and is coped into the vertical stops at each end. As will be seen on the transom bar detail, the water table of the transom sash need not be set up as in the lower sash, since it



is hinged at the bottom and the drip will be lifted clear of the beveled strip when opening the transom. The sash is  $1\frac{3}{4}$  inches in thickness. I would recommend nothing less.

Care must be taken in designing casements that the transom bar does not come directly on the sight line. It is extremely aggravating to be forced to stand upon one's tip-toes or to stoop in order to see out of a window.

I have found that if on the first floor the glass of the lower sash is made 32 inches in height and the transom glass 10 inches, and the windows are placed so that the head casings are brought in line with those of seven foot doors, the transom bar will not interfere with one's view from the window. On the second floor if 6 foot 8 inch doors are used the lower sash should have 30 inch glass and the transom lights should be 8 inches high.

Up to this point I have spoken only of transoms from a purely utilitarian standpoint. Now let us briefly look at them from an esthetic point of view. In beauty double-hung windows are not to be compared with them. Casement windows have all antiquity in their favor. They are also especially adapted to being designed in clusters of two, three, four, five or even more, which does not detract the least from their beauty, rather augmenting it.

Casement windows are usually cut up into small panes, this formerly being accomplished by the use of wood muntins. These wood muntins were objected to on the grounds that sash so divided were difficult to wash. The glass is now usually cut up with copper, zinc or lead bars about one-half inch wide which lie flat against the glass and present no obstruction to cleaning. The copper bars are preferable, a more rigid job being the result.

## How to Estimate

*I. P. Hicks*

### Fourth Article

**W**E will now take up the matter of estimating porch work. One of the most important point is to arrive at the labor cost with the greatest degree of accuracy. The framing, flooring, ceiling and roofing may be readily estimated, as we have shown before, under headings that include all such work.

The cornice, columns, rail, balusters, lattice, etc., present some new things to figure out. Referring now to Figure 8 we will first find the cornice work. We have an outside and inside frieze, a soffit, bed mold, planceer of beaded ceiling, a fascia and an inside ceiling mold which we will figure as follows:

Inside and outside frieze, two members, 8c; soffit, 3c; planceer, 7 boards  $3\frac{1}{4}$  face ceiling, 7c; bed mold, 1c; fascia, 2c; ceiling mold under porch, 1c; making a total per lineal foot of 22 cents.

The setting of ordinary porch columns can be figured at 50 cents each and porch newels at 30 cents. The rail and balusters we will figure as follows: The top and bottom rails at 4c each per lineal foot and the balusters at 4c each. As the balusters on this porch run about 3 to the foot, the rails

and balusters will figure 20c per lineal foot for labor.

The outside base per lineal foot, 3c; cove, 1c; making a total of 4c per lineal foot.

Next comes the lattice, this part it is best to estimate by the square foot because the depth of the lattice may vary all the way from a few inches to three feet or more. This can be figured at 8c to 10c per square foot. If the sections are of good size figure 8c; if small, then figure 10c per square foot and you will be close to the right figure. In estimating the lattice, figure 10 lineal feet to each square foot.

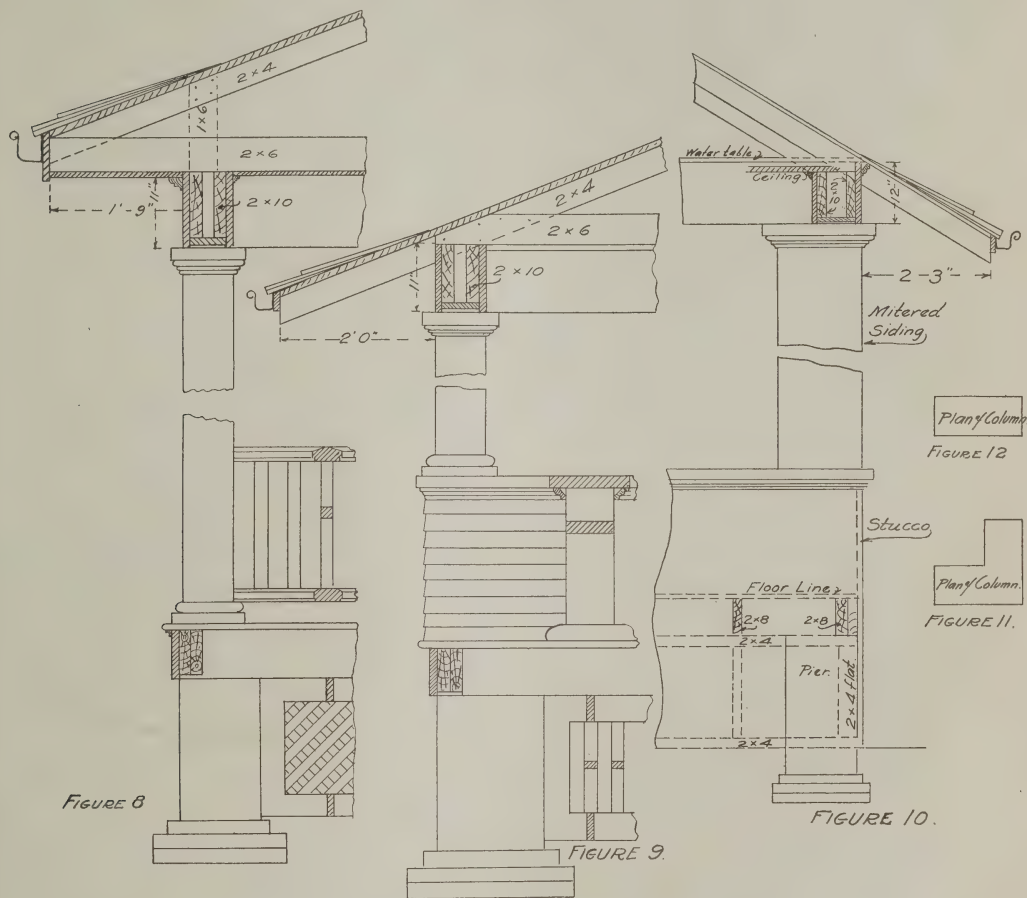
In estimating porch steps, length up to 4 feet, figure 75c per step; length 5 to 7 feet, \$1.00 per step; length 8 to 10 feet, \$1.20 to \$1.40 per step.

Figure 9 represents another style of porch which may be figured as follows: Outside and inside frieze, 8c; soffit, 3c; bed mold, 2c; planceer 9 boards of  $3\frac{1}{4}$  face ceiling, 9c; fascia, 2c; ceiling mold, 1c; making a total of 25 cents per lineal foot. On this porch we have a heavy rail with mold outside and inside; for this figure 8c per lineal foot for the heavy rail and 1c each for the molding, making 10c per lineal foot.

It will be noticed that this porch has a sided rail. Figure the siding by the square or by the 100 feet, as previously quoted; then for every lineal foot of mitered corners add 10 cents.

On this porch we have a different kind of lattice, making a little less labor from the fact that only one member is used where the other form required two. Figure this kind at 6c to 8c per square foot. The set-

The framing, flooring, ceiling and roofing can be figured in the usual way. The cornice is similar to Figure 9 but a little wider. It figures as follows: Outside and inside frieze, 8c; soffit, 3c; planceer 11 boards of  $3\frac{1}{4}$  face ceiling, 11c; bed mold, 2c; fascia, 2c; ceiling mold, 1c; making a total of 27 cents per lineal foot. The rail can be figured at 10c per lineal foot, same as in Figure 9. Now the columns are alto-



ting of the columns, base and steps can be figured the same as on the former porch.

Figure 10 shows another distinct style of porch. This porch is framed up and plastered with stucco from the grade line up to the porch rail. The columns are built up of 2x8 frames, sided with  $\frac{1}{2}$ x4-inch siding with mitered corners. Figure 11 shows the plan of the corner columns. Figure 12 shows the plan of the center column. The idea is to give the columns a massive appearance.

gether a different proposition because they are sided with  $\frac{1}{2}$ x4-inch siding, with mitered corners. The corner columns have 5 mitered corners and 1 inside corner which should be coped. The middle column has 4 mitered corners. These columns are 8 inches thick and show an 18-inch face and will usually measure 5 to  $5\frac{1}{2}$  feet in length above the rail.

Just to show how a carpenter would lose out figuring this kind of work by the square we will give some figures. The corner col-



umn would require about 50 feet of siding; figured at \$1.50 per 100 feet it would make the cost of labor 75 cents per column. The average man will hardly side more than two of such columns in a day; making \$1.50 for his day's work. Now suppose we add for the mitered corners and the one inside corner that has to be coped, 10c per lineal foot for each corner, figuring 5 feet to each corner. This would make the column figure up to \$3.75 per column, and would insure the contractor against losing out on this kind of work. Look well to these slow and tedious jobs for they are the money losers. It is easy to see them if you will just stop for a minute and listen to reason when you figure.

On this porch there is no lattice to figure, but instead there is the stucco to figure. This properly is mason work but the cost on metal lath, all complete for material and labor, can be figured at \$1.25 per yard.

For the matter of making a comparison we will estimate these three porches at a given size, say 8x24 feet with 3 columns and four steps 6 feet long, showing both the material and labor cost.

#### THE MATERIAL.

640 ft. dimension lumber at \$27....	\$17.28
250 ft. flooring, \$45 .....	11.25
240 ft. ceiling, \$30 .....	7.20
120 ft. cornice planceer, \$30.....	3.60
300 ft. roof sheathing, \$27.....	8.10
3 M shingles, \$4 per M.....	12.00
260 ft. $\frac{7}{8}$ finish, \$45.....	11.70
42 ft. $1\frac{1}{8}$ finish, \$50.....	2.10
72 ft. $\frac{7}{8}$ cove, $\frac{1}{2}$ c.....	.36
48 ft. ceiling mold, 1c.....	.48
48 ft. bed mold, 1c.....	.48
70 ft. porch rail, 5c.....	3.50
100 balusters, 4c .....	4.00
600 lineal feet lattice, $\frac{1}{2}$ c.....	3.00
3 porch columns, \$3.....	9.00
1 porch newel .....	1.00
Total.....	\$95.05

#### THE LABOR.

640 ft. dimension lumber, \$10.....	\$ 6.40
490 ft. flooring and ceiling, \$15....	7.35
300 ft. roof sheathing, \$10.....	3.00
3 M shingles, \$2.....	6.00
52 lineal feet cornice, 22c.....	11.44
40 lineal feet base, 4c.....	1.60
Setting 3 porch columns, 50c...	1.50
Setting 1 porch newel, 30c.....	.30

33 lineal feet rail and balusters, 20c.	6.60
4 steps, \$1 .....	4.00
66 square feet porch lattice, 10c...	6.60
Total .....	\$54.79
Lumber .....	95.05
Add for incidentals 5%.....	17.49

Total cost .....\$157.33

Now suppose you wanted to estimate the cost of this porch right quick without going into any of the details. Many might suppose that a rate might be established per lineal foot of porch. This of course could be done but such a rate will not be anywhere near as useful or as reliable as a rate per square foot of floor surface, because some porches may be six, seven, nine or ten feet wide instead of eight feet, as in this case. This ought to make it plain that when you figure by the square foot of floor surface you figure exactly what the porch covers and there is not a bit of guess work about it. Establish a rate per square foot for the different kinds of porches you build and figure by it and you will very soon be able to come right close to the mark on porch work.

The square foot of floor surface for this porch is 192 feet, which makes the cost approximately 82 cents per square foot for the material and labor. Nails, painting and gutters are not included. The carpenter can easily ascertain the cost of these items if he has them to figure on.

We will now estimate porch Figure 9, which is of somewhat different construction.

#### THE LUMBER.

730 ft. dimension lumber, \$27.....	\$19.71
250 ft. flooring, \$45 .....	11.25
240 ft. ceiling, \$30 .....	7.20
150 ft. cornice planceer, \$30.....	4.50
300 ft. roof sheathing, \$27.....	8.10
3 M shingles, \$4 .....	12.00
190 ft. siding, \$30 .....	8.70
260 ft. $\frac{7}{8}$ finish, \$45.....	11.70
42 ft. $1\frac{1}{8}$ finish, \$50.....	2.10
72 ft. cove mold, $\frac{1}{2}$ c.....	.36
48 ft. ceiling mold, 1c.....	.48
48 ft. bed mold, 1c.....	.48
36 ft. porch rail, 12c.....	4.32
80 ft. mold under rail, 1c.....	.80
3 porch columns, \$2.25.....	6.75
180 ft. porch lattice, 1c.....	1.80
Total .....	\$100.25

## LABOR.

730 ft. dimension lumber, \$10.....	\$ 7.30
490 ft. flooring and ceiling, \$25....	7.35
300 ft. sheathing, \$10 .....	3.00
3 M shingles, \$1.50 .....	4.50
52 lineal feet cornice, 25c.....	13.00
40 lineal feet base, 4c.....	1.60
Setting 3 porch columns, 50c...	1.50
36 ft. porch rail, 10c.....	3.60
190 ft. siding, \$1.50 .....	2.85
Add for mitering and coping	
corners .....	2.00
4 steps at \$1.....	4.00
66 square feet lattice, 6c.....	3.96
Total .....	\$ 54.66
Lumber .....	100.25
Incidentals, 5% .....	7.74

Total cost .....\$162.65

This porch figures approximately 86 cents per square foot of floor surface.

We will now figure porch design No. 10.

## LUMBER.

845 ft. dimension lumber, \$27.....	\$22.81
250 ft. flooring, \$45 .....	11.25
240 ft. ceiling, \$30 .....	7.20
170 ft. cornice ceiling, \$30.....	5.10
300 ft. sheathing, \$27 .....	8.10
3 M shingles, \$4 .....	12.00
234 ft. $\frac{7}{8}$ finish, \$45.....	10.53
42 ft. $1\frac{1}{8}$ finish, \$50.....	2.10
72 ft. cove mold, $\frac{1}{2}$ c.....	.36
48 ft. ceiling mold, 1c.....	.48
66 ft. bed mold, 1c.....	.66
36 ft. porch rail, 10c.....	3.60
80 ft. mold under rail, 1c.....	.80
150 ft. siding, \$30 .....	4.50
Total .....	\$89.49

## LABOR.

845 ft. dimension lumber, \$10.....	\$ 8.45
490 ft. flooring and ceiling, \$15....	7.35
300 ft. sheathing, \$10 .....	3.00
3 M shingles, \$1.50 .....	4.50
52 lineal feet cornice, 27c.....	14.04
36 ft. porch rail, 10c.....	3.60
150 ft. siding, \$1.50 .....	2.25
Add for mitered corners.....	8.00
4 steps at \$1.....	4.00
Total .....	\$55.19
Lumber .....	89.49
25 yards stucco plaster, \$1.25...	31.25
Incidentals, 5% .....	8.79

Total cost .....\$184.72

This porch will cost approximately 96 cents per square foot of floor surface.

These three examples in porch work, together with the details of construction and the estimate in detail, should be of considerable interest to the contractor and ought to make him quite familiar with one of the best systems of estimating porch work. Porches will vary in design and construction but the system of estimating we have so thoroughly explained ought to enable anyone to arrive at approximately the proper cost on any kind of porch work which they may be called upon to figure. Keep an account of your porch work, find out what each porch figures per square foot of floor space, then when you are called upon to figure a porch, you can figure it in three minutes and without making out any bills of material. Without a doubt this method of figuring will save you a lot of useless figuring for people who just want to build a porch.

Where the existence of quicksand in the soil was a matter of common knowledge in the locality of a proposed building and the contractor made an examination of the premises before entering into the contract, the mere fact that the owner knew of the existence of the quicksand and did not disclose it to the contractor does not entitle the latter to abandon the contract, in the absence of a showing of intentional concealment or deception.—*Ford & Denning v. Shepard Co.*, 90 A. (R. I.) 805.

Mere part payment by the owner for the construction of a building, whether with or without knowledge of the builder's failure to perform the contract, does not, as matter of law, constitute an acceptance of the work of construction and a waiver of such failure to perform, unless, perhaps, to the extent of such payment with such knowledge where such acceptance and waiver is consistent with all the pertinent facts in the case.—*Wiebener v. Peoples*, 142 P. (Okla.) 1036.



# Wall Board and Its Uses

*Charles P. Rawson, Architect*

**W**ALL BOARD is a modern substitute for lath and plaster and other materials for covering walls and ceilings. There are many kinds on the market made from many kinds of materials. All have many advantages in common and each kind has several distinctive claims made for it.

No matter what kind of a room you wish to finish or remodel; no matter what type of building it is in; no matter where it is located or what time of the year it is, wall board will make a permanent, beautiful and sanitary covering for the walls and ceilings. Wall board will not crumble, chip or crack like plaster, it will not burn or carry fire as quickly as wood lath, it does not need repairs, and interior decorations applied to it are safe and may be put on immediately without fear of injury. In application wall board is clean and convenient and there is no delay or litter. In cost, it should be less than lath and plaster in most localities and under most conditions, sometimes as low as 40 per cent of the latter's cost.

Wall board comes in sheets of various sizes but most manufacturers make sizes of 32 inches and 48 inches in width in order to fit the ordinary spacing of wood studs and ceiling joists. Some wall board also comes in 24 and 36 inch widths. In lengths the sheets run from four feet to sixteen feet. We shall have more to say later as to sizes and the sizes of rooms, the spacing of openings, etc.

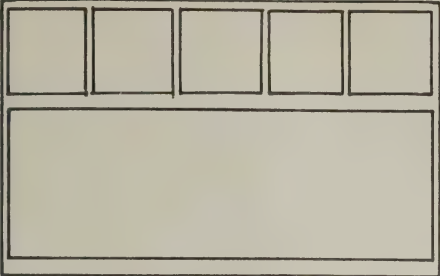
Of course, wall board finds its largest use in the covering of walls and ceilings of residences, but there are many other uses in which it may add to the comfort and beauty of the home. Partitions may be built of it to divide rooms; old plaster which will hold neither paint nor paper may be covered with it and decorated; an unfinished attic may be divided and ceiled providing additional quarters in a crowded house; it may be used to cover the cellar ceiling, keeping dust from the floor above; it may be used for the lining of cupboards and cases and the making of shelves and shirt waist boxes. Some kinds of wall board may be used on the outside of houses for wall and gable covering and panels.

Wall board is as perfectly adapted for the most expensive and beautiful building as it is for the modest home, and until the introduction of this material it was impossible to obtain beautiful paneled and painted effects without great cost. The endless opportunities for paneling and color treatment, make each room different from the others, and all form one harmonious whole.

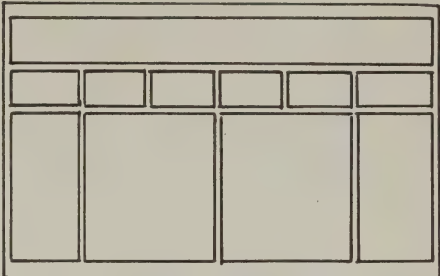
In other buildings than homes, wall board has many uses; in stores it may be used for ceilings, window backgrounds, booths, rooms for the display of furniture, booths for musical instruments, display table tops, and dressing rooms; in office buildings its uses for partitions will reduce one of the largest expenditures and it is excellent for telephone booths and consultation rooms. In factories where constant vibration would prevent the use of plaster and wood is too expensive and burnable, wall board supplies an increasing number of uses. Ceilings may be covered with it, doing away with the exposed beams and greatly improving the light.

On the farm, plasterers are hard to get and their work must be done at the season of the year when the farmer himself has no time. He can use wall board himself and in the winter time. He can renew his old plastered rooms, and line his barns and poultry houses and the walls of small buildings. In railway stations, where vibration has been detrimental to the use of plaster and forced the use of beaded ceilings, wall board has found a large field of usefulness. Booths at fairs and expositions, on account of wall board's simplicity of application, its cleanliness and economy, should be built of it. There are many other uses for wall board and many other reasons for using it but lack of space prevents any further recital of them.

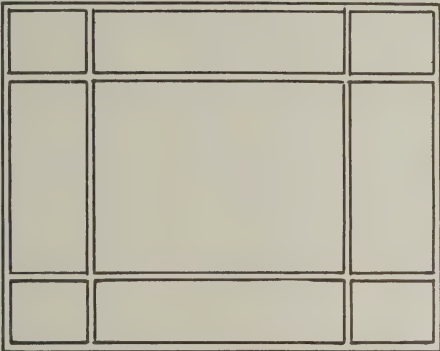
In figuring the amount of wall board for any room, include only the space actually to be covered, the openings should not be included as is done in figuring plastering. This usually makes a difference in favor of wall board of about twenty per cent. A room should be planned before it is started, especially if the walls and ceiling are to be paneled. The studs should be so set that



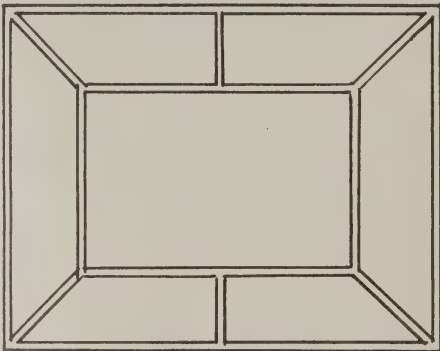
SIDE WALL



SIDE WALL



CEILING



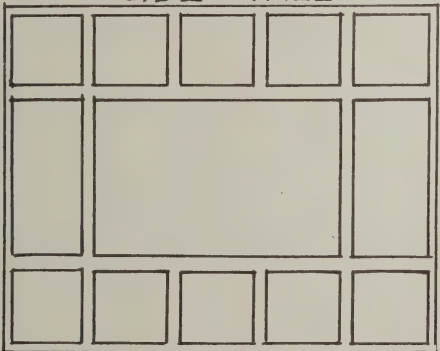
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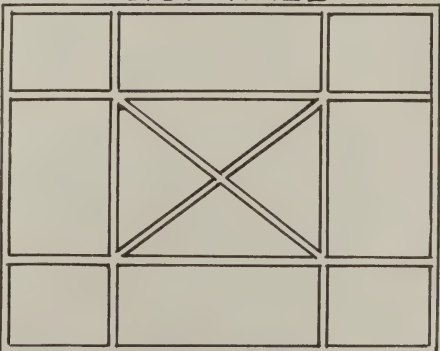
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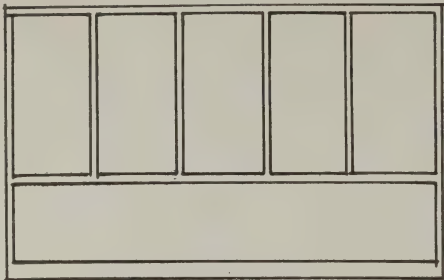
CEILING



CEILING

SUGGESTIONS FOR PANELING





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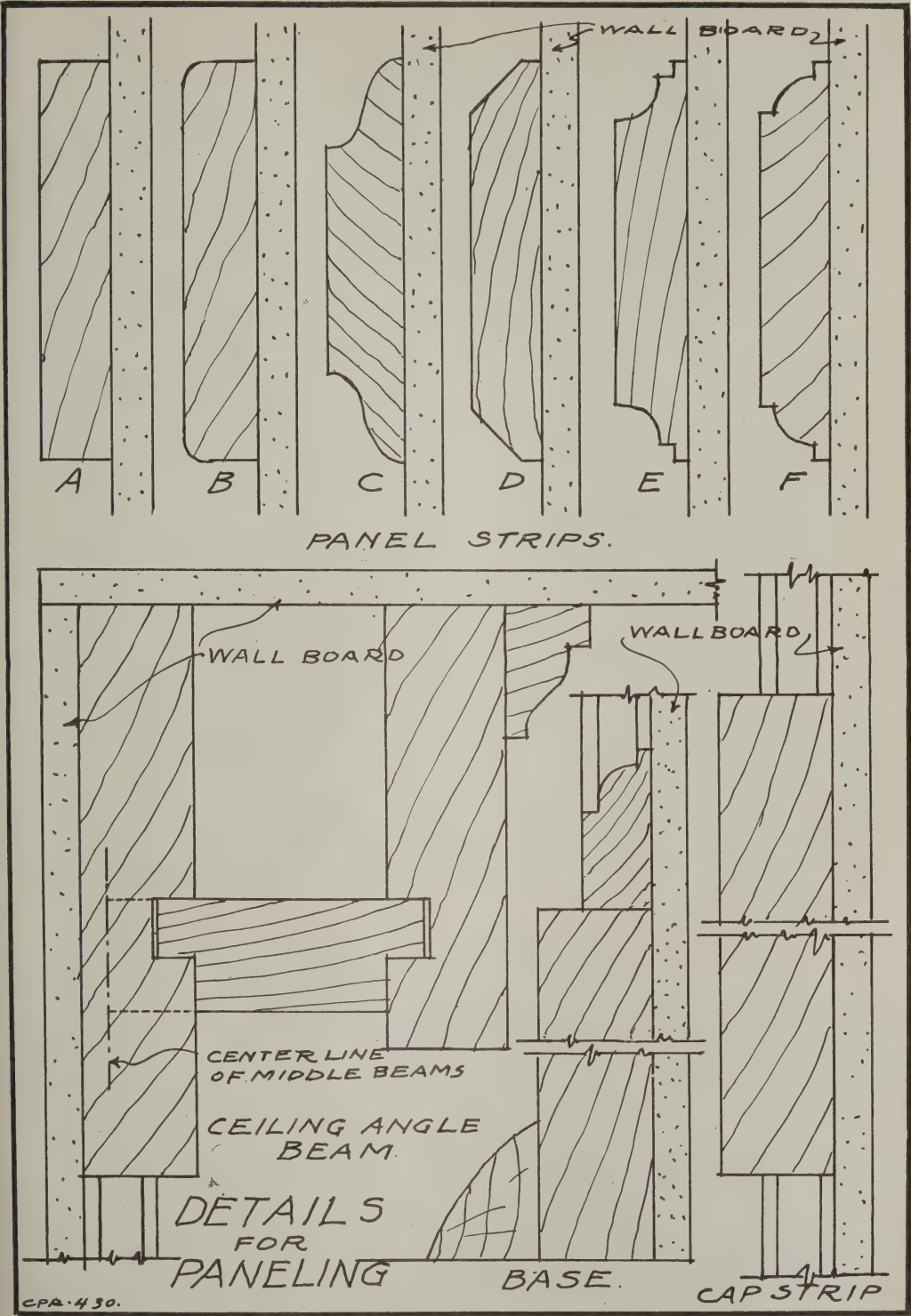


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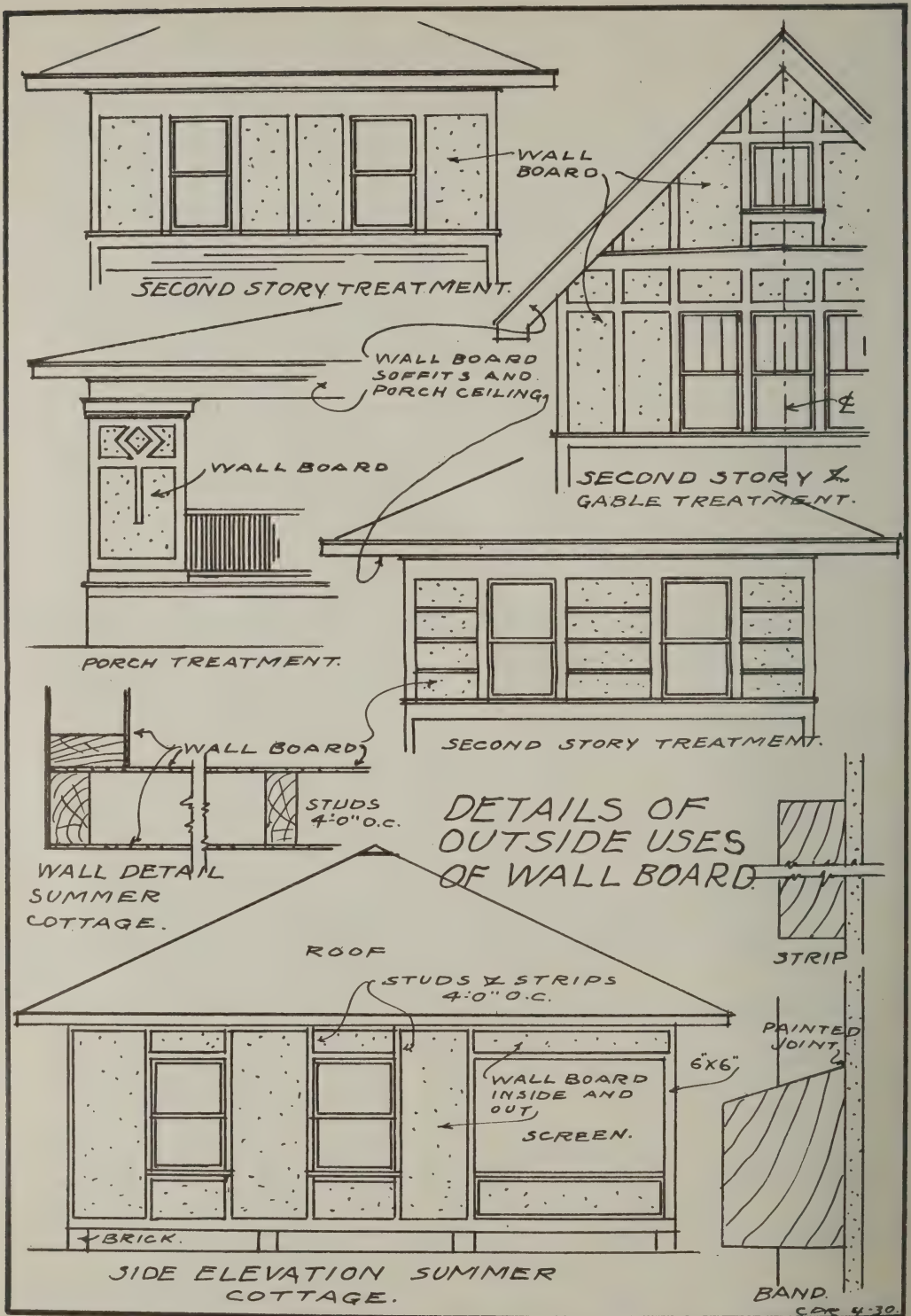


CEILING.

SUGGESTIONS FOR PANELING







even sizes of board may be used and panels worked out evenly. All horizontal joints should have a header let in between the studs and between all joints for cross joints. Do not unpack wall board until you are ready to use it and do all necessary cutting with an ordinary saw, the board being supported firmly on a table. Save all sawed off pieces for off spaces over doors and windows, etc.

In nailing on the board use a 4-penny wire nail in new work, and a 6-penny nail if over old lath and plaster. Nails should be spaced about three inches apart on the edges and five or six inches apart along the center studs. The center nails should be driven first and those along the edges last. Do not butt joints but leave  $\frac{1}{8}$  to  $\frac{1}{4}$  inch space between them. This will either be covered with panel strips or be filled with crack filler. Some very beautiful effects may be made by paneling and we show herewith several designs for same and give details of panel strips.

If panels are not desired, then the joints should be filled with crack filler. Fill the joint full and wipe a little of it over the nail heads. After it is dry, smooth with fine sandpaper. The walls are then ready for tinting, painting or for covering with wallpaper. Some manufacturers make a gummed tape for use over cracks where the board is to be wallpapered.

Drawings 1 and 2, shown herewith, give various ways of paneling sidewalls and ceilings. Drawing 3 gives details of panel strips, bands, base and ceiling beams. These details are drawn full size. Care must be

taken in laying out panels to work them in harmony with the doors and windows. In new work, this is usually easy to do, but in re-covering old walls, it is more difficult and we recommend the use of crack filler or tape instead of strips for this class of work. Also we do not advocate the use of strips in all the rooms of a house. Wallpaper may be used to advantage in many cases. No strip used should be thinner than those shown and from this dimension they may expand to any limit in keeping with the size, use and general character of the room.

Drawing 4 indicates a few of the outside uses of wall board. Three designs for paneling of the upper part of walls and gable are given. Wall board may also be used to advantage in the making of panels on porch columns, etc., also for the soffits of cornices and for the ceilings of porches. It is much better for these purposes than wood. In the construction of summer cottages, studs may be spaced 4 ft. 0 in. on centers and covered on both inside and outside with wall board and all joints covered with vertical strips, one at each stud. There should be no horizontal joints, as in this kind of work, one strip of wall board should reach from sill to eave. In the panels under the porch rail, etc., a single thickness of wall board will do, held in by mouldings.

All wall board in use on the outside of buildings should be well painted before and after strips are put on and all horizontal strips should be put on with a painted joint. Wall board is to be kept well painted and this must be remembered in its use as an external covering.



Residence at Pasadena, Cal.

Green & Green, Architects





A House Planned for Economy

J. H. Newson, Architect

## Ready Money

*Ben F. Cobb*

I DO not know when I have ever taken up a photograph and floor plans of a house and studied them more carefully than I have the ones accompanying this article, and now I will tell you why I named the article "Ready Money." The architect tells us that it has been built for \$2,000.00, and that under more favorable circumstances it could be built for \$1,500.00 to \$1,800.00. It has the appearance of a house costing much more than the largest of these prices named, therefore it ought to be "Ready Money" for the builder who builds to sell.

This house is of the bungalow type and still it has more the appearance of a real two-story house than it does of a bungalow. The lines are fine, the porch gives it an imposing appearance, and the real plainness of the elevation gives it a rich, substantial look. We often see a house where the lines

are so plain that they give a severe look, but not so with this one. If I were a real estate salesman and could not sell this house for a good profit over the cost I would give up my claim to salesmanship.

It is not often that I am enthused over a house plan, still I am ten times more interested in them today than I was when I first began to write of them. It is easy to criticise the work of the other fellow, but there are two things that a critic usually forgets. First, that what he criticises as a poor plan, someone else might admire and appreciate, and second, if he could really produce something himself he would not be spending his time criticising others. As I do not aspire to be a critic I propose to step inside this house and see what I can find to commend. However, if there is anything very bad about it I may say something in that direc-

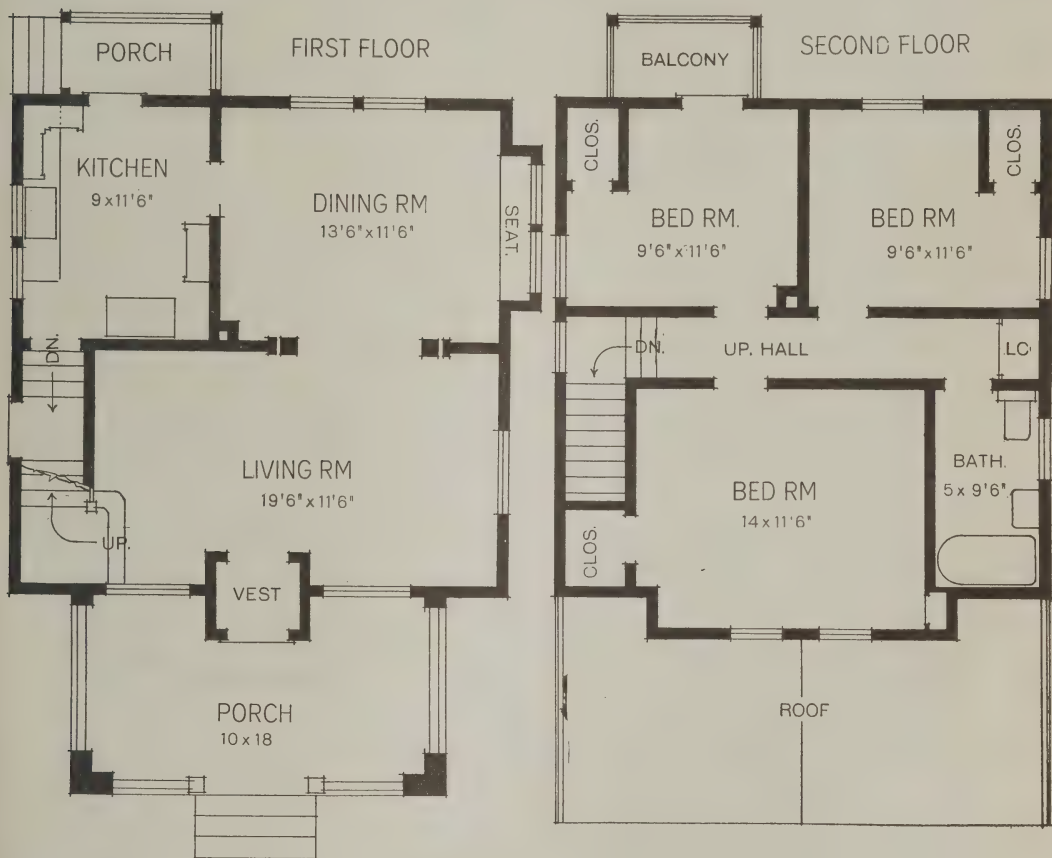
tion as I have done some planning and building myself.

First, we come to the porch which might be easily screened in and made more serviceable for use in pleasant summer evenings. This porch is worthy of special mention for it adds so much to the general appearance of the house. We might say that it conforms to the rest of the house, which simply means that the house as a whole has a very complete, finished look.

I once knew a man who considered him-

If you will study men and houses you will find they are much alike. You will sometimes meet a man who does not look right to you and you are obliged to look him over carefully to find out that he has on a bright yellow vest that spoils the effect of the rest of his outfit. A house is the same, for after the carpenter and mason have finished a very creditable job the painter may come along and put a yellow vest on it.

As we go into this house we find good



self well dressed provided he had a new hat and new shoes. Of course, he wore the full complement of clothes but it did not matter if they were a little soiled or threadbare, as long as his roof and underpinning were well taken care of. Of course, the man looked better than if he had neglected his hat and shoes, too, but to be noticeably well dressed, one cannot stop at hat and shoes any more than you can build a handsome house by putting on a fine roof and building a splendid foundation.

sized rooms and everything conveniently arranged. There are no dark rooms in this house, every room having plenty of outside windows. At first glance I was sure the upper hall was dark, but at one end of the hall over the stair landing is a window large enough to provide an abundance of light.

On the whole the writer is willing to put his stamp of approval on this plan which only amounts to an opinion at best, but you all know we all think well of our own opinions.



# Our Dictionary of Trade Terms

**ALTO-RELIEVO.**—In Sculptured Work in Architecture, or Art Decorations. Figures cut or carved so high as to appear very nearly detached from the surface or base. Eng. pron. all-toe-ray-leev-oh. When the relief or projection is just half the depth or height of the figure, the term used is *Mezzo-relievo*, meaning middle relief, pron. med-dzo-ray-leev-oh. When it is less than half its full projection, the relief is termed *Bassor-relievo*, meaning low relief, pron. Bas-soh-ray-leev-oh. Syn. Fr. *Rondebosse*, pron. ron-d-boss—from *ronde*, round, *bosse*, a knob, a lump. Ger. *Hockrelief*, pron. hodge (the guttural sound of ch)—ray-lief (hoch, high).

**ANGELS.**—In Architecture. Brackets or Corbels (which see) finished with the heads and necks of angels. They are chiefly used in Gothic or Pointed architecture.

**ANGLE BAR.**—In Carpentry. The window bar at the corner of a projecting window.

**ANGLE FLOAT.**—In Plastering. A tool termed a "float" (which see) made to suit the inside angle formed by the meeting of the two sides of the room, to work the surface of the plastering.

**ANGLE IRON.**—In Iron Work for Roofs, Bridges, etc. Bars of wrought iron rolled so as to have their sides at right angles to each other, thus: L. Syn. Fr. *Fer a corniere*, pron. fair ah korn-ee-air (fer, iron, corniere, a gutter or corner plate—from *cornier* (korn-ee-eh, a corner); Ger. *Winkeleisen*, pron. vin-kel-ize-en (from *winkel*, a corner, angle and *Eisen* (ize-een) iron).

**ANGLE RAFTER.**—In Carpentry. Otherwise termed a "hip rafter," being the rafters placed at the corners of the building which is covered with a hip roof or truss, of which the ends have the same inclination or angle of slope as the sides.

**ANNULET.**—In Architecture. A narrow moulding, square or flat on face, used to separate other mouldings. The narrow and

flat or squared face moulding, or part separating the flutings or hollowed out parts in columns or pillars, or in pilasters, are also called annulets. The word is directly derived from the Latin *annulus*, a ring. Syn. Fr., *Annelet*, pron. Ann-lay, *annelet*, a little ring, from *annelet* (ann-lay) to curl or twist round; Ger. *Ringelchen*, pron. ringelchen, a ringlet from *ringeln*, to curl or bend round, to ring.

**ANTAE.**—In Architecture. Flat pillars, otherwise termed pilasters, projecting from the wall. Syn. Fr. *Antes*, or *Pilastres*, pron. an-taes, pea-lasstz; Ger. *Anten*, pron. Antane or—tenn.

**ANTE CHAMBER.**—In Architecture. In domestic architecture usually termed an ante-room, a small room attached to, or connected with, a larger apartment, entered either before or from the large room as the ante-room of a drawing room. Syn. Fr. *Antichambre*, pron. aunt-eh or aunty-shawm-beer; Ger. *Dasborzimmer* (ver, before, *zimmer*, chamber), pron. fore-tzeem-err; Also *das Eintrittzimmer* (*Eintritt*, entry, entrance), pron. ine-trit-zim-err.

**APART**; in construction. A term used to denote the distance between two pieces, as two beams or walls, and is equivalent to the expression "the distance or length in the clear or inside dimensions." Syn. Fr. *Dans* (within), *Euvre* (work)—pron. dangs-oov or dang-zoove-uh, Ger. *Innerlich* (internal) *im* (Contr. for in dem, in the), *Gebäude* (building or edifice)—pron. in-err-leegh *im* geh-boy-deh.

**APARTMENT** in Basement, Cellar, or Underground. In some parts called the "cellar kitchen." Syn. Fr. *Tellier*—pron. tell-ee-eh; Ger. *Unterirdisches Gemach* (from *unter*, under, *irdisch*, earthly, and *Gemach*, a room or chamber)—pron. Oon-tare-eer-dee-shess gay-magh.

**APARTMENT**, in Domestic Architecture. A room or chamber in the house, as distinguishing one room from another—literally "a place set apart." Syn. Fr. *Appartement*—pron. Ah-part-mang; also *Chambre*—pron. shawm-ber; also *Piece*—pron. pee-ace; Ger. *das Zimmer*—pron. tzim-err; also *die Stube*—pron. stoo-beh; also *die Kammer* (a chamber)—pron. kahn-merr.

\* The Materials made use of in this Dictionary of Terms, Methods and Explanations, are drawn largely from the following works: Grollt's Encyclopedia of Architecture; Peter Nicholson's Works, Parker's Architectural Glossary; Ward & Lock's Technical Dictionary; Sir Wm. Chambers's Works, Garnesey's Architectural Terms; Newland's Universal Carpenter, and many other works, besides extracts from current technical literature, etc.

**APERTURE OF A DOOR**, in Architecture. A door void, or opening. The space left in the wall of a house in which the door frame is fitted. Syn. Fr. Jour de porte (from jour, a day, figuratively "a hole showing daylight," and porte, a door or gateway)—pron. joohr or zhoor-deh-pohrt; Ger. die Thuroffnung (Thur, a door Oeffnung, opening)—pron. tuh-eff-noong.

**APERTURE OF A WINDOW**—otherwise called a Window Void, or Opening. The opening left in a wall into which the casement or window frame is to be fitted. Syn. Fr. Bail (bay) de croisee (casement)—pron. bahl-deh krwah-say; Ger. die Fenster (window) Oeffnung (opening)—pron. fenstare eff-nung.

**APEX**, of a Gable. The upper or highest point. The term is purely Latin, meaning the top or upper part, or summit, of any object. Eng. pron. eh-pex, not ah or awe-pakes. Syn. Fr. Sommet (the summit) de Pignon (gable)—pron. som-may deh pee-nyong, or peen-yong; Ger. der Schritel (top or crown) der Geibel (gable)—pron. shi-tel, derr gee-bell.

**APIARY**, in Garden Architecture. A house, or rather a covered stand or shed, for the reception of hives of bees and their shelter from the weather. Der. Latin apiarium, and this from apis, a bee. Syn. Fr. Rucher (from ruche)—pron. roosh (a hive) pron. roo-shay; Ger. der Bienenstand (Bienen, a bee, stand, a station or position) pron. bee-nen-howss.

**APOPHYGEE**, in Mouldings. The curve—frequently the quadrant of a circle, though it may be a lesser arc—which joins the bottom or lowest part of a column or shaft of an "order" or of a Pilaster (which see) with the uppermost member of the base—or conversely, the curve joining the top of a shaft with the lowest member of the capital. It is sometimes, although not generally, known also as the "scape" of a shaft, column, pillar, or pilaster. Syn. Fr. Conge

—pron. kihn-gjay; Ger. Anlauf—pron. ann-lowf; Eng. pron. ah-poff-ee-gee (g. soft).

**APPROACH**, in laying out house sites and grounds. The road or walk leading from a private walk or private road to the house. Der. from the French verb, approcher (app-ro-shay), to bring or come near to, and this from proche (prohsh) near to. Syn. Fr. Abord—pron. ah-bore, approach, access to, landing, and this from aborder (ah-bore-day), to come near to, Ger. Zugang—pron. tzoo-gang, an avenue, an approach (from Gang, a walk or passage).

**APRON LINING**, in Joinery. The boarding generally panelled, which covers the ends of the steps supported by the carriages, otherwise known by the string boards. Syn. Fr. Revetement (clothing or covering) de Limon (carriage of a stair)—pron. ray-vett-mang day lee-mong; Ger. die Bechalung (from beschlen, to cover with a shell, from Schale, a shell), or der Treppenbalken (from Treppe, a step, and Balken, a beam, i. e., the carriage for the steps)—pron. dee beh-shawl-oong, derr trep-pen-ball-ken.

**APSE**, in Achitecture. The name given to the rounded form, and generally semi-circular, by which the aisles or the choir of a church are terminated. This feature is a peculiarly foreign or continental one. Churches in France and Germany, and in many parts of Italy, are met with in almost every district displaying it. In England it is met with chiefly in churches built in the Norman style, of which it may be said to be a peculiarity. The term apse is also applied to all projecting parts giving recesses or chapels at the sides of the transepts, etc. Eng. Pron. apps. Syn. Fr. Chevet—pron. shay-vay, Rond-point—pron. rongd-pwang; Ger. Baseliken—pron. bah-seel-ee-kenn, so-called from this being a feature of the early churches, changed from the Roman baselicas or halls of justice.

(To be continued.)

A building contract requiring compensation to be paid in monthly payments "based on the estimated value of the material and labor incorporated in the building" indicates that the only material and labor to be paid for was that which was incorporated in the building.—Stewart v. Spalding, 141 P. (Ore.) 1127.

When an owner has exercised due care to employ an architect to prepare plans and specifications for a building, and builds accordingly, he should not be held liable for any defects, unless they were such that he should have known of them.—Prest-O-Lite Company v. Skeel, 106 N. E. (Ind.) 365.



# A Morris Chair

Ralph M. Windoes

ANOTHER favorite project with the amateur cabinet maker is the Morris chair, and the design we present for one with this article is of the best. It has enough curved parts in its construction to take it out of the "Mission" class. For instance, the front rail is slightly curved, the arm braces are curved, and the arms themselves have rolls on the front end and the edges are rounded, while its simplicity of construction is still maintained.

The illustration shows quarter-sawed white oak as the wood used, and it is highly recommended for this kind of work. Order the stock *planed* and *sandpapered* to the exact dimensions given below:

Slant adjusters

4 pcs.  $2\frac{1}{2}$ "x $2\frac{1}{2}$ "x22" legs  
2 pcs.  $\frac{3}{4}$ "x5" x26" front and back rails

2 pcs.  $\frac{3}{4}$ "x4" x26" side rails

2 pcs.  $\frac{3}{4}$ "x5" x40" arms

8 pcs.  $\frac{1}{2}$ "x $3\frac{7}{8}$ "x17" slats

2 pcs.  $\frac{3}{4}$ "x2" x28" side uprights of back

4 pcs.  $\frac{3}{4}$ "x2" x24" center uprights of back

1 pc.  $\frac{3}{4}$ "x2" x19" top rail of back

1 pc.  $\frac{3}{4}$ "x3" x19" bottom rail of back

2 pcs.  $\frac{3}{4}$ "x2" x23" seat supports

1 pc.  $\frac{3}{4}$ "x $1\frac{1}{2}$ "x48" arm braces and

1 pc.  $\frac{3}{4}$ "oak dowel rod 27" long

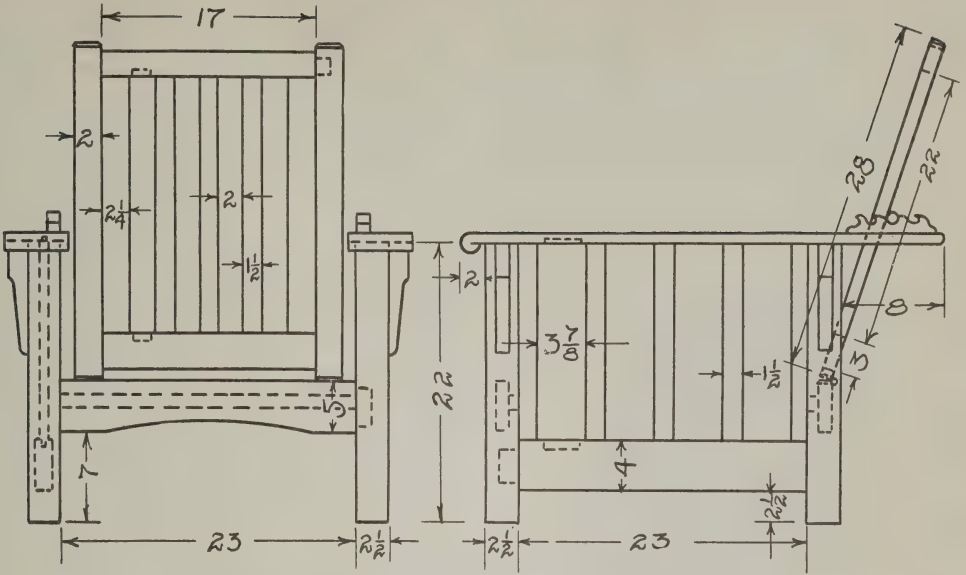
Begin the construction by cutting the mortises in the legs. On each leg mark the *poorest* adjacent faces as the *working faces*, but be very sure that these faces form a right angle. If the mill man has been careful in his work they will, but if they do not test up square, plane them so yourself. This "working corner," then, will be the inside corner of each leg, and it will be in these faces that the mortises will be cut. Lay the mortises for the front and back rails out very carefully with the knife, try-square and gauge, and place them in the position which they will occupy when the chair is assembled, for verification. If they are laid out correctly, put a cross, while they are still in the above position, at each point where the side mortises will be cut, marking the posts with numbers so that the

legs will be in the same position relative to each other when they are again compared. Now lay the side mortises out, compare them again, and cut all of the holes in the legs. One and one-half inch is the proper dimension for the depth of each,  $\frac{1}{2}$ " for the width, 4" and 3" for the length, front and side, respectively.

Next lay out and cut the tenons on the rails which join these mortises, then put these parts together. Clamp them up dry, and test for squareness. If correct, lay out and cut the mortises in the side rails for the slats, and cut the tenons on the lower end of the slats to fit in these mortises. Measure the exact distance from the top edge of the side rails, when they are in place, to the upper ends of the legs. This distance will be the dimension of the slats between the shoulders of their tenons;  $\frac{1}{4}$ " is long enough for these tenons.

The arms are given in the mill bill 40" long, while they are, in reality, 38". This extra 2" is to be sawed off and glued on to one end for the "roll." The detail drawing of the arm will make its construction clear. Notice that the edges are round for  $\frac{1}{4}$ ". This can be rounded with the plane, spoke shave, and sandpaper, and great care should be exercised to do a neat job. When finished, place the arms in position on the chair and mark the mortises for the upper tenons on the slats. Cut these mortises and put the entire chair together with clamps, but do not glue, as the arms need to be fastened. The best way is to dowel them on to the legs, using two  $\frac{1}{2}$ " dowel pins in each. A simple way to locate the centers for the holes into which the dowels will be put is to make a small depression with a nail in the end of the leg at each point where the dowel is wanted. Into these depressions place small BB shot, so that part of the shot projects above the leg. Carefully placing the arms into position on the shot, rap lightly with the mallet, and black marks will be left on the under side of the arms exactly over the nail depressions. Bore the holes into the arms to the depth of  $\frac{5}{8}$ ", and into the legs about  $1\frac{1}{2}$ ".

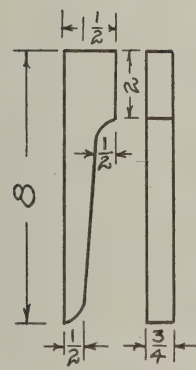
You are now ready to glue the chair together. Sandpaper any rough or dirty spots



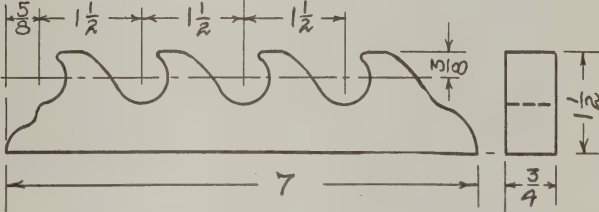
FRONT VIEW

SIDE VIEW

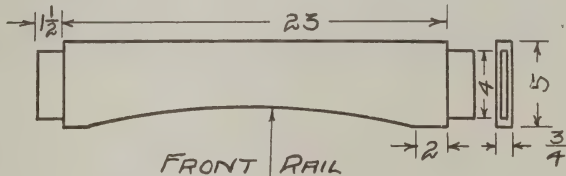
DETAILS



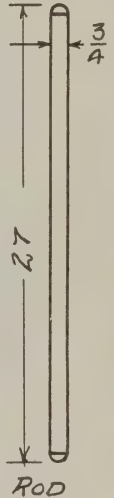
ARM BRACE



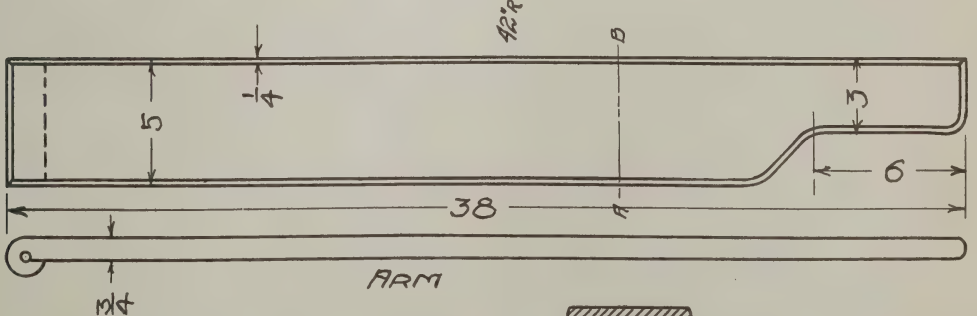
SLANT ADJUSTER



FRONT RAIL



ROD



ARM

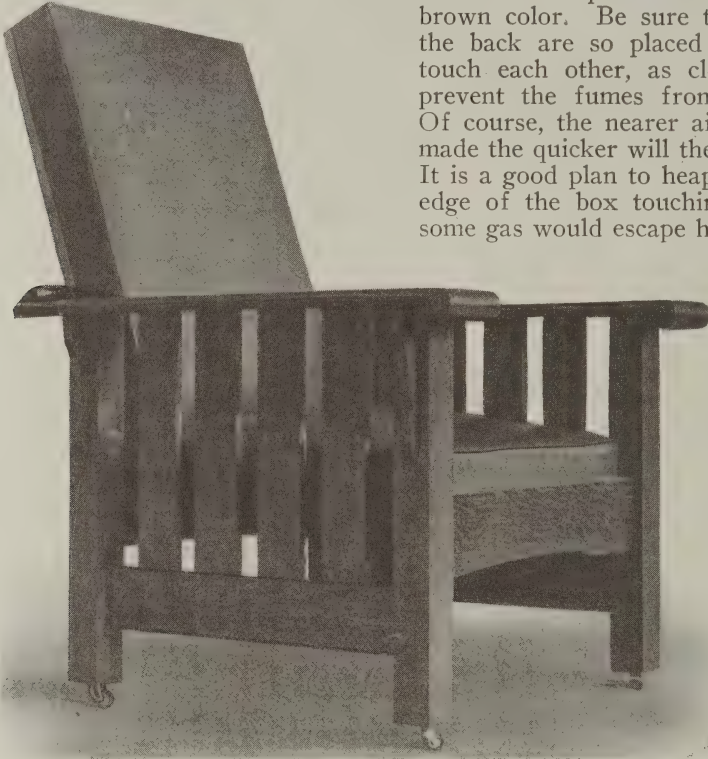
SECTION A-B



in evidence, and apply cold glue to the tenons and dowel pins. If the builder has enough furniture clamps, he may do all of the gluing at one time, but, unless he has at least twelve he had better glue up the sides alone, and when these have set, glue in the back and front rails.

While the glue is drying out, construct the back. It is mortised throughout, as the drawing clearly shows. Glue this up and

Any of the popular oak finishes described before can be applied to this chair, but we would recommend the fumed. To fume this chair properly, remove the back and place the entire chair under an inverted box whose cracks and knot holes have previously been tightly covered over. Into this box will also be introduced two open dishes of commercial liquid ammonia, the fumes from which will react with the tannic acid in the oak to produce the well known nut brown color. Be sure that the chair and the back are so placed that they do not touch each other, as close contact might prevent the fumes from coloring evenly. Of course, the nearer air tight the box is made the quicker will the action take place. It is a good plan to heap earth around the edge of the box touching the ground, as some gas would escape here. It will prob-



The Completed Chair

cut the braces for the arms. These are doweled in place and glued. The slant adjuster should come next. The detail drawing shows how it is made, the holes being bored with a  $\frac{3}{4}$ " bit. Do not fasten the adjusters in place until the back has been hinged on to the chair. When this is done, place and screw on from the under side of the arm, one of the adjusters. Into its center hole lay the  $\frac{3}{4}$ " dowel rod so that it touches the back on both uprights, and runs through the second adjuster through its center hole. Now mark the position of this second adjuster, remove the rod and the back and screw it in place. This completes the construction.

ably take from eighteen to twenty-four hours to secure the correct depth of color, depending, of course, on the size of the box, how near air tight you have made it, how many dishes you have placed in the box and the strength of your ammonia. It would be a good plan, also, to insert a stick of oak through a small opening in such a way that it could be withdrawn occasionally and its color noted.

When fumed, rub it over with a coat of boiled oil, shellac it, and give it a heavy coat of wax.

In regard to the cushions, our illustration shows spring box cushions, which are highly recommended. As the seat is square,

the cushion can occasionally be turned, which will give it a longer lease of life. If the loose stuffed cushions are wanted, you will need five or six slats running across

the seat supports. Any upholsterer will make the cushions. The cost running from \$5.00 to \$20.00, depending upon the grade of materials used.

# Architectural Drawing Lessons

## Twenty-Ninth Article

THIS chapter would not be complete without a few words on the "laying washes of color." It is scarcely necessary to say that the first step must be to carefully clean up the drawing with India rubber so as to remove all pencil marks, and if necessary to rub the drawing over carefully with bread crumbs. Care should be taken with these, however, as the bread crumbs, if scrubbed in unmercifully, are almost as effective as ink-eraser, and can easily spoil the inking in a drawing. If any doubt whatever exists as to the water-proof qualities of the ink, it is best to wash over the whole drawing with clean water and a large brush, drying off the water immediately on clean blotting paper. By this means that which would run is dissolved, and soaked up immediately into the blotting paper, leaving the drawing perfectly clean and ready for coloring.

When applying large washes of flat color, it is best to elevate the top of the board so that the color will flow more freely down to the bottom. The tint should be mixed in excess rather than too little, and care should be taken to see that the tint is very light. One is apt to misjudge the effect of a large body of the same color from a small sample tried on a scrap of paper, for what in the sample appears to be right will often prove to be too dark when laid on in a wash. The mixed-up color in the palette, or saucer, should be stirred around every time the brush requires more color, otherwise, as many of the colors are heavy, the particles will collect in the bottom of the saucer and the tint be rendered uneven. Especially is this necessary where reds or browns and blues are mixed, for the specific gravities of the two colors are so different that the particles separate, and the color changes in tint unless frequently mixed up. The largest brush full of color must be employed for the large washes, and be carried right across the top of the space to be colored, and continued downward in

successive horizontal strokes across and back, until the bottom of the drawing is reached; the principal point to bear in mind being that the brush must always be full of color! Should any of the lines be inadvertently overstepped the color should be pushed back with the finger, and the mistake rectified. When the whole space is covered with the wash, dry the brush and use it to soak off the color, which will remain in a little pool all along the bottom of the drawing, until there is no excess of color left. To the beginner this apparently drastic use of a veritable sea of color is somewhat alarming, but it is the only means by which an even wash can be obtained, and with care and practice no mishap should occur, while the largest surface can be covered with a tint so flat that it might be mistaken for the actual color of the paper.

It is advisable in all cases, especially with drawings which may have become a little greasy, and it is absolutely necessary on cloth and paper tracings, to mix a little "ox-gall" into the color, as this insures the color lying evenly. Care should be exercised not to employ too much, as ox-gall is liable to dirty the tints, particularly light washes of yellow ochre and light red.

Very frequently it happens that portions of the drawing have been scratched out with a knife and renewed. All these spots should be carefully noted mentally before the washes are applied, as the color will soak into them more and leave a darker tint. This can be avoided by sopping up the extra color with a small pad of clean blotting paper, and the spot should be continually "dubbed" till the tint has begun to dry and the particular portion ceases to darken. When thick colors are required to be used for a long time, such as dark venetian red for walls in section (the coloring of which may take a couple of hours on a large plan), care should be taken to keep the color from drying in the saucer. In order to keep the tint about the same



A B C D E F G H I J K  
 L M N O P Q R S T U V  
 W X Y Z 1 2 3 4 5 6 7 8 9

a b c d e f g h i j k l m n o p q r s t

A. u v w x y z. § ¶ & 7

Tell me, where is

Plan, Elevation, or



• A Sheet of Gothic Lettering •

Figure 151

thickness, in warm weather particularly, a drop of water should be mixed into the saucer every second or third time the brush is refilled with color.

The modern Indian ink bottle is usually

pens with. It is advisable to keep the bottles closed as much as possible as the modern ink dries very quickly, and soon thickens if exposed to the air.

The drawing pens should not be filled very full, as this usually results in blots, which takes longer to remove than it does to refill the pen; likewise, a penful should not be used up to the bitter end, as this will spoil the quality of the line.

If the pen is to be laid aside for a few minutes, the ink should be first removed by drawing a piece of cloth or folded blotting paper between the nibs, and if it is a hinged pen, it should be opened occasionally and given a thorough cleaning. Ultimately the nibs of a drawing pen become worn at one side, as the pen is always used in the same direction, and it begins to give a line of shaky quality. This can be put right by very carefully sharpening the pen on an oilstone, rubbing down each nib separately from the outside first, and then bringing them down together, and then testing with ink and trying again until desired line is obtained without cutting the paper; but perhaps it is safer to send to an instrument maker to be "set."

Figure 150, in last month's lesson, is a page of lettering that is in common use and which we hope the student has, and will, copy until he has become expert in the formation of the letters. In Figure 151 we show another type of letter which will be found a little more difficult to follow than those shown on previous pages, but they make excellent examples for practice. Gothic lettering is chiefly used on church work, that is, if the church itself has a Gothic character.

The window shown in Figure 152 is a simple Gothic one, and is often made use of in plain work for the country. It is easily followed and is quite instructive, as well as being a good example for practice.

(To be continued.)

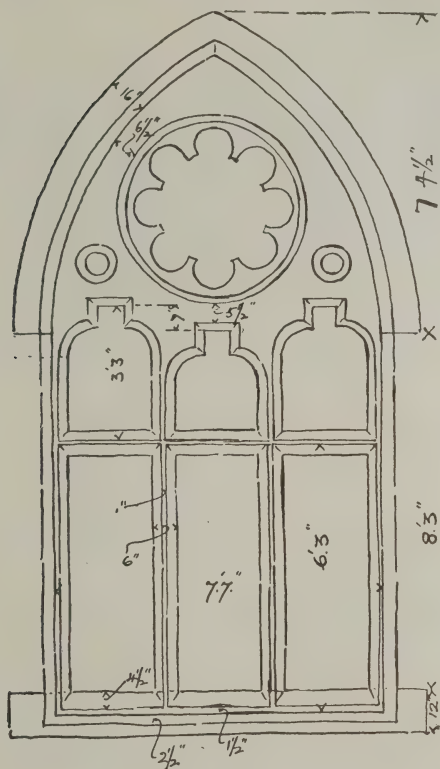


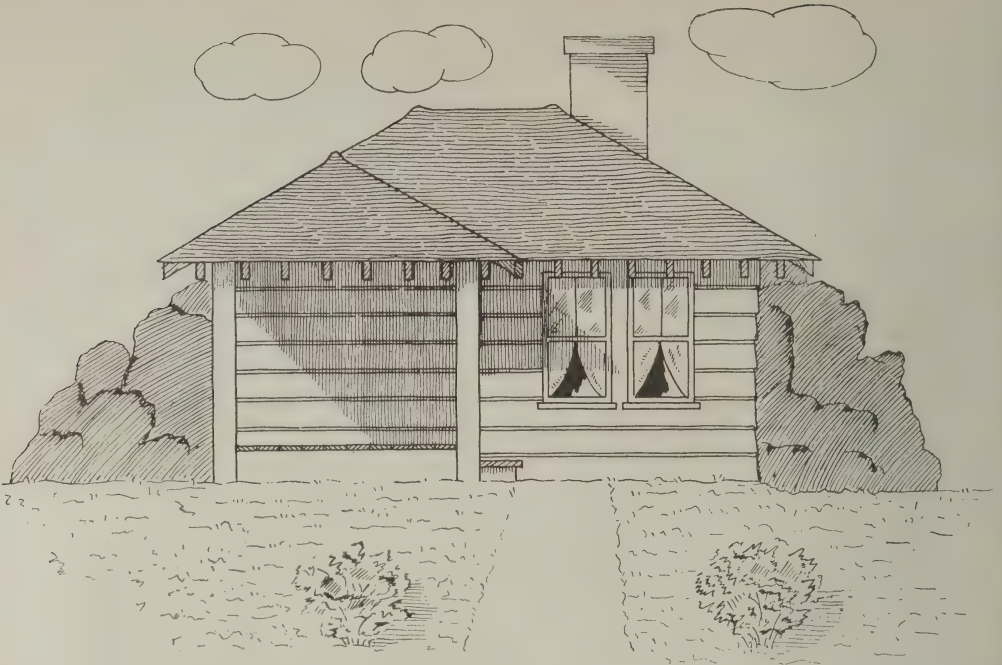
Figure 152

supplied with a cork having a quill in it for filling drawing pens. This looks very useful, but it is usually cut so blunt that it is difficult to fill the pen cleanly, and besides this, it does not reach to the bottom of the bottle unless the cork is jammed quite home, which makes it a two-handed matter to fill the pen. Consequently it is generally preferable to cut the quill off and use an ordinary pen for filling the drawing

An "independent contractor" is one exercising an independent employment under a contract to do certain work by his own methods, without subjection to the control of his employer, except as to the product or result of the work.—*Prest-O-Lite Company v. Skeel*, 106 N. E. (Ind.) 365.

The Dangerous Employment Act of 1911 (Acts 1911, c. 236) had no application to the liability of an owner for injuries to an employe of an independent contractor, engaged in constructing a building, from the collapse of such building.—*Prest-O-Lite Company v. Skeel*, 106 N. E. (Ind.) 365.





A Modest Summer Cottage

L. E. Russell, Architect

## Small Beginnings

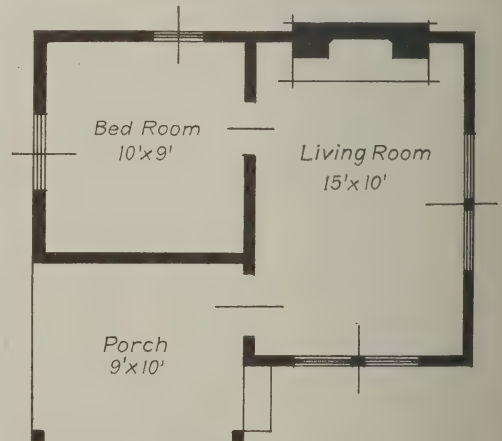
*Ben F. Cobb*

**I**T is never a good plan to despise the day of small things. A home of your own, even though there is only two rooms in it, will bring more solid comfort than a hired apartment of four times that number. When the time comes that the house is too small for the increasing family, or when the business of the man of the house has sufficiently improved that the luxury of a larger home can be afforded, the little two-room house will sell or rent.

The selection of a location on which to build is very important for two reasons if not more. First, it is advisable to select a building lot in the best neighborhood possible to insure agreeable neighbors; secondly, if the time comes when you desire to sell, the better the neighborhood the better price you can ask. Transportation, nearness to school, and nearness to stores must all be considered.

Summering by the seashore or in the country in a little two-room cottage or a tent has been a splendid education to some people. It has shown them that the pure

country air and plenty of sunshine has compensated them for the loss of the conveniences of the big house in the city.



Floor Plan

Good health is the greatest blessing that can be bestowed on anyone and a house too small to accommodate servants has often

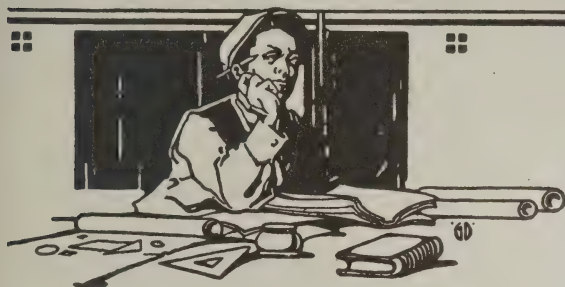
been the means of bringing the roses back to the cheeks of the wife.

Housework is said to be healthful exercise but too much may be as bad as an overdose of medicine. Someone has suggested that this house is so small that one

would be compelled to go out doors to turn round, but even that has its advantages.

You have heard the saying: "Many hands make light work." Here is another: "Small rooms and few of them make light work for few hands."

## OUR READERS PAGES



[The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessarily for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experience will be given proper space.—Ed.]

### Answers

#### "BOOKS ON SCAFFOLDING"

From "Publisher," New York City:

I do not know of any book published, altogether devoted to the construction of scaffolding. There are several English works of merit on the market, one of which is "Thatcher on Scaffolding," a very good one, and quite suitable to American practice. I believe there is a book in preparation, by a well known American firm, and parties wanting such a book, would do well to advise THE NATIONAL BUILDER'S office, who will take their names, which will insure them early copies. The book will not be out for some time yet, and not many will be published for the first edition. The author is well known to every American carpenter.

#### ESTIMATING.

From "Builder and Carpenter," New York City:

I might say to "young-un" of Buffalo, that cubing when estimating for a contract, is not reliable by any means and should never be used by inexperienced builders. When made use of by well-trained men, the method is fairly correct and is oftener nearer the exact figure than a detailed estimate, for nothing is left out, and if there are errors they will not be in the items, but in the price per foot figured, and it is only given to a few men to determine what that

figure must be. A fraction of a cent per foot, makes the difference between profit and loss. The successful "cuber" must have knowledge and much practical experience to be able to decide on the amount. Once this is done, the matter is easy and is a sort of a royal road to the sought result, for the method of arriving at the cubical contents of a building is a simple operation in arithmetic. There are a number of books, any one of which will teach you how to obtain the cubical contents of any sized or shaped building. With regards to the title of books, "Hodgson's Estimator," is about as good as any of them, Hick's Estimator and Brady's are both good books, and there are several others, that are also good. I prefer Hodgson's because it is in good sized type, plain speaking and contains a lot of good common stuff, although I don't swear by it, for it is not faultless, but it is almost as perfect as any I have met with.

#### ROUGHCASTING

From "Plasterer," Toronto, Ont.:

Replying to your correspondent of Duluth, who signs himself "Mudslinger," which I don't think is very nice of him. The plasterer—when he is a good plasterer and knows his business—has every reason to be proud of his trade instead of belittling it and talking of it contemptuously!



The first thing required, in making a good, sound piece of work is to have a good, solid base for the work. The walls should be stiff and immovable, as a rickety building will not show good plastering very long. The lathing should be well done, the laths being nailed on diagonally, as this tends to strengthen the whole work. It should then be pricked up with a coat of good mortar composed of lime, sand and hair, or other fibrous material—Sisal—or other similar stuff chopped up to the right length. This coat should be laid on the wall to an even smooth surface and when dry a second coat of the same material should be applied and made as smooth as it can be spread. As fast as this surface is finished, a helper should follow him with a pail of prepared roughcast which he bespatters over the new plastering and the whole is left to dry together. The roughcast is composed of fine gravel and clean sand which is washed clean of all earthy substances, and is mixed with pure lime and clean water till the whole is of a semi-fluid consistency. This is thrown on the wall with a wooden float, about five or six inches long, and as many wide, made of thin pine and fitted to a suitable handle of wood. With this tool the workman throws on the roughcast with his right hand while in his left he holds a whitewash brush, which he frequently dips in the roughcast and washes the parts he has bespattered, thus giving it a regular finished and uniform appearance.

#### DRY ROT.

From "Architect," Buffalo, N. Y.:

I may say to "Ignoramus," of Flint, Mich., that it is pretty difficult to prevent dry rot, but the life of timber may be very much lengthened if it is well seasoned at the start, and where good ventilation for it is provided for, etc.,—when in place in a building. These are essential. Charring

and coal tar are recommended. To cure dry rot, a solution of corrosive sublimate in water (an ounce to a gallon, used hot) is a good wash. When dry rot results from want of ventilation no cure will be effective short of supplying the necessary air. The best cure is to substitute new timbers for rotten ones, clear away every particle of fungus from adjoining walls and timbers, afterwards apply the wash given for the preservation of timber. Coal tar will effect the same purpose, or a weak solution of vitriolic acid with water will generally stop the rot if it has not gone too far, and pyroligneous acid is recommended to prevent the spread of dry rot. When linoleum or kamptulicon are fastened down to wood floors dry rot is almost inevitable; free ventilation under the boards will prevent it, but that is generally impracticable—or when practical it is difficult to obtain sufficient ventilation.

#### BOILER SETTING.

From "Old Mason," Dayton, O.:

For the information of "Bricksetter," Middletown, N. Y., I submit the following: Brickwork for boiler setting is very different from ordinary work. The joints should be thin, and both inside and out must be very carefully executed. Kaolin or prepared clay should be used as a mortar for the firebrick, and mixed so thin that it must be put on with iron spoons instead of trowels. The firebrick should be dipped in water before laying so that it will not take up the water in the cement. Every sixth course beginning with the grates should be headers well bonded into rear. They must be well bonded into the setting to hold upper parts of wall in position as the lower courses of fore brick burn away. This admits replacing any damaged fire bricks without rebuilding the entire wall.

## Questions

#### ESTIMATING WOODWORK.

From "Bricklayer," South Bend:

Please give me a few "pointers" on the methods of making estimates for brickwork. I am a new beginner in taking contract work. I can lay brick all right and flatter myself that I can do good work, but I do not know much about figuring on the

cost of work, and would be glad to get any instructions or advice on this subject.

#### CYPRESS.

From "Ignorant," Winnipeg, Man.:

I want to know a few things about cypress. Where it comes from and if it costs as much as oak. Is it as lasting as oak?

Is it easy to work and has it a fine grain? Any information will oblige.

#### FUMING OAK.

From "Amateur," Montclair, N. J.:

I am making a few pieces of furniture for myself, and am anxious to have them look like "old oak" and have been told this can be done by fumigating the woodwork with ammonia. Will some one kindly inform me how this is done and oblige.

#### FURNITURE GLUE.

From "S. S.," Phoenix, Ariz.:

Will some kind reader tell me through the columns of THE NATIONAL BUILDER which is the best glue to reglue old furniture with, Le Page's or Cabinet Makers?

#### PAINTING IRON WORK.

From "Country Painter," Bloomingdale, Ill.:

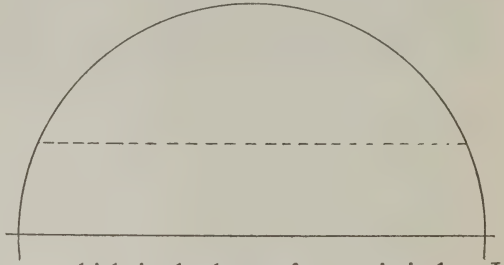
I have a contract to paint a number of country road bridges, and the specifications

read, "Prime all iron work with good red lead and linseed oil, also all hardwood that may be used in the construction of the work." The next two coats are to be a reddish brown or coffee color. Why use red lead for priming color?

#### BISECTING A SEMICIRCLE

From O. E. F., Hutchinson.

I would like to find a method of bisecting a semi-circle by a line parallel to the diam-



eter, which is the base of a semi-circle. I would also like the proof that the method is correct.

## Book Notices

All books noticed in these columns may be obtained from this office at publishers' prices.

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FIVE HUNDRED PLAIN ANSWERS TO DIRECT QUESTIONS ON STEAM, HOT WATER, VAPOR, AND VACUUM HEATING. By Alfred G. King. Cloth. Price \$1.50, postage paid. This is evidently a really practical book of more than ordinary utility and is well suited to the purposes of every person who has more or less to do with steam, or other pipe heating plant, or power machinery, ventilation or practical hot-water or steam heating. It contains 214 pages and 127 good, clean illustrations, which tend largely to aid the reader to a clear understanding of the author's meaning of what he has written. In order to give an idea of the scope of the work we submit a number of the questions asked, and which the author answers at length, and the answers are to be found within the pages:

Why should a chimney be built round or square? How are cast iron boilers rated? What are the cooling surfaces of a building? What is meant by exhaust heating? For what purpose is equalizing pipe employed? What is accelerated hot water heating? Describe the principle of vacuum heating? What is the thermostatic prin-

ciple? What is a non-mechanical system of water heating and what type of radiators are employed for vapor heating? Describe atmospheric pressure? What method is employed to determine the safe working pressure of tubular boiler? etc.

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# LEGAL DECISIONS

OF INTEREST TO BUILDERS

*Prepared for the*  
**NATIONAL BUILDER**  
*by* **George H. Murdock**

The owner of a building cannot diminish an architect's recovery for services, on the ground that ornamental plaster fell because put on while the building was insufficiently heated, where the contract did not require the contractor to furnish heat, and the building was constructed in mid-winter; the duty of furnishing heat obviously resting on the owner, and not on the contractor or the architect.—*Johnson v. O'Neill*, 148 N. W. (Mich.) 364.

A contract for the construction of a building providing that the contractors shall provide all the materials and perform all the work, entered into pursuant to an offer of contract stating that the contractors will furnish at their own expense such machinery, tools, and equipment as are necessary, requires the contractors to furnish such tools, machinery, and equipment at their own expense.—*Stewart v. Spalding*, 141 P. (Ore.) 1127.

Where the owner of a building under construction elected to take charge of the work on the contractor's failure to complete the building according to plans and specifications, as authorized under the contract, such election terminated the contract, and, if the amount required to complete the building was less than the amount withheld to secure performance by the contractor, the owner was indebted to him for the difference.—*Funk v. House*, 168 S. W. (Tex.) 481.

Where the owner of a building under construction took over the work as authorized to do under the contract, by which he was also entitled to retain a part of the price to secure performance, an instruction that he was not liable for any balance, unless the building was com-

pleted to the satisfaction of the architects and accepted by them, was properly refused, since the contractor's breach could not deprive him of the right to such balance of the price as might remain after the owner had completed the building according to the contract.—*Funk v. House*, 168 S. W. (Tex.) 481.

Mere occupancy and use of a building by the owner does not, as a matter of law, constitute an acceptance of the work of construction and a waiver of nonperformance by the builder of the stipulations in the contract and does not ordinarily justify inference of acceptance as a fact.—*Wiebener v. Peoples*, 142 P. (Okla.) 1036.

As where it appears, by the complaint of a building contractor for compensation, that the procuring of the architect's certificate is a condition to his right to payment, so where such condition is shown by the answer, and is admitted, plaintiff must show that he obtained it, or an excuse for not doing so, such as arbitrary or capricious action of the architect, or that it was waived by the owner.—*Lindblom v. Mayar*, 142 P. (Wash.) 695.

A contractor and builder who has in good faith endeavored to perform all that is required of him by the terms of his contract for the construction of a building, and has in fact substantially performed the same, is ordinarily entitled to sue upon his contract and recover the contract price less proper deductions therefrom on account of omissions, deviations, and defects chargeable to him, especially where the owner occupies and uses such building.—*Wiebener v. Peoples*, 142 P. (Okla.) 1036.

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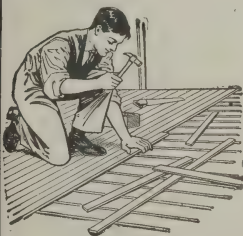
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A provision in a building contract authorizing the owner to retain twenty per cent. of the contract price, to be paid on satisfactory completion and acceptance of the entire work after the expiration of fifteen days from final completion, and that such twenty per cent. should be held by the owner as a security for the faithful completion of the work, and might be applied, under the direction of the architect, in liquidation of any damages under the contract, implied only that, in case the owner had to complete the building, the completion should be under the direction of the architect and the damages determined by the amount required to so complete it, and did not make the architect the arbiter of the amount of damages for the contractor's failure to complete the building according to the contract, or authorize the architect to direct the application of the balance held by the owner to the satisfaction of such damages.—*Funk v. House*, 168 S. W. (Tex.) 481.

Where a contract for the construction of a building requires the same to be done to the satisfaction of the owner and reserves to him the right without the duty of supervision and direction, his acquiescence in or his failure to object, during the work of construction, to minor and slight omissions, deviations, and defects, of which he has knowledge, before the builder has abandoned the work to him as completed, and he is occupying and using the same, will ordinarily and when not excused be regarded as a waiver of such nonperformance.—*Wiebener v. Peoples*, 142 P. (Okla.) 1036.

The provision in a building contract, making the procuring of the architect's certificate a condition precedent to the contractor's right to payment, is not waived, in the contractor's action for compensation, by the answer, wherein, by setting out the contract in full, such condition is first shown, it alleging the building "has never been accepted according to said contract," though alleging damages from defective construction, at least where no evidence of damages is introduced; but the defense of nonacceptance is again asserted by motion at the close of plaintiff's evidence for dismissal, the allegation of nonacceptance according to the contract being a separate defense from

the allegation of damages, and the latter allegation not being inconsistent with the former.—*Lindblom v. Mayar*, 142 P. (Wash.) 695.

Where a contractor with the state for doing certain work procured a surety company to execute a bond required by the state for the faithful performance of the work, for which it agreed to pay an annual premium until the surety should be discharged from liability, the contractor was not released from liability for the premiums by the fact that during a portion of the time the contract was in litigation, and was finally adjudged invalid; no steps having been taken in the meantime for the discharge of the bond.—*Mizell v. Elmore & Hamilton Contracting Company*, 215 F. (U. S.) 88.

An assignment by a contractor to plaintiff recited the fact that the contractor had theretofore contracted with a school district to construct a school building, whereby the trustees were to pay certain amounts monthly as the work progressed until its completion and the balance upon completion and acceptance of the building, and, in consideration of an advancement, assigned to plaintiff \$430, "out of the payment that is to be paid to me, \* \* \* upon the completion and acceptance" of the building, and the school trustees indorsed thereon that they recognized the assignment and agreed to pay such sum to the assignee out of the payment to be made to the contractor at the time of completion and acceptance of the building. *Held*, that the fund upon which the assignment operated was that which would become payable to the contractor upon completion of the building in accordance with the terms of the building contract, it being a mere equitable assignment of moneys subsequently to become due, and in no way purporting to convey a present interest, and hence upon abandonment and failure of the contractor to complete the building defendant's liability ceased to exist.—*Lynip v. Alturas School District of Modoc County*, 141 P. (Cal.) 835.

An offer to make good defective work under a building contract, made after the beginning of suit, was not legally equivalent to a performance of the contract.—*Hennessey v. Preston*, 106 N. E. (Mass.) 570.

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Building Material Price List

Revised to Date

\*Price not given. yp—Yellow pine. wp—White pine. np—Norway pine. op—Oregon pine. rw—Redwood. s—Spruce. oc—Ontario cedar. h—Hemlock. bc—British Columbia cedar. rc—Red cedar. F—Fir. cdr—Common cedar. cyp—Cypress. bm—Board measure. sls—Sized one side. d4s—Dressed four sides. kd—Kiln dried. rg—Rough. c—Clears.

	Seattle, Wash., Corrected by F. T. Bradley.	Chicago, Corrected by J. H. Touchstone.	Omaha, Neb., Corrected by I. P. Hicks.	Southern Ontario, Corrected by F. O. Frantz.
Dimensions—	M ft. BM	M ft. BM	M ft. BM	M ft. BM
	S2S	S2S	S2S	S2S
2x4 in. to 8 in. up to 16 ft., No. 1.....	\$10.00	\$20.00	yp \$27.00	h \$27.00
2x4 in. to 8 in. up to 16 ft., No. 2.....	9.00	17.00	25.00	22.00
2x4 in. to 8 in., 18 and 20 ft., No. 1.....	10.00	22.00	28.00	30.00
2x10 in. up to 16 ft., No. 1.....	11.00	21.00	30.00	24.00
2x12 in. up to 16 ft., No. 1.....	11.00	22.00	32.00	25.00
2x14 in. up to 16 ft., No. 1.....	12.50	23.00	*	26.00
Each 2 ft. over 20 ft., add per M.....		1.00	1.00	2.00
Select stock as above, add per M.....	4.00	5.00	*	*
Exterior Finish, Etc.—		M ft. BM	M ft. BM	M ft. BM
		D4S.	D4S	D4S
1x3 in. to 1x8 in., No. 1.....	27.00	yp \$30.00	yp \$45.00	wp \$40.00
1x16 in., No. 1.....	39.00	40.00	43.00	40.00
1x12 in., No. 1.....	30.00	35.00	46.00	42.00
1¼x3 in. to 1¼x12 in., No. 1.....	33.00	45.00	48.00	45.00
1½ in. and 2 in., same as above.....	33.00	45.00	48.00	42.00
1-in. drop siding, No. 1.....	25.00	25.00	30.00	30.00
½-in. lap siding, No. 1 cedar.....	25.00	24.00	rdw 30.00	30.00
Enclosing and Fence Boards—		M ft. BM	M ft. BM	M ft. BM
		S1S	S1S	S1S
1x4 in. to 1x8 in., No. 1.....	11.00	yp \$24.00	yp \$25.00	wp \$30.00
1x8 in. to 1x12 in., No. 1.....	11.00	26.00	24.00	h 24.00
1x16 in., No. 1.....	15.00	*	24.00	24.00
1x16 in., No. 2.....	13.00	*	22.00	22.00
Interior Finish, Flooring, Ceiling, Etc.—		M ft. BM	M ft. BM	M ft. BM
		DS	D4S	D4S
1x6 in. T. & G. Flooring, No. 1.....	25.00	yp \$24.00	yp \$38.00	wp \$40.00
1x6 in. T. & G. Flooring, No. 2.....	22.00	20.00	34.00	wp 30.00
Ceiling, per M.....	20.00	21.00	22.00	21.00
Partition, per M.....	30.00	32.00	32.00	32.00
¾x4-in. Ceiling, No. 1.....	22.00	22.00	30.00	np 30.00
4¼-in. Moulded Casing.....	100 ft. run \$2.00	100 ft. run yp \$1.75	100 ft. run yp \$2.00	100 ft. run wp \$2.50
4¾-in. Moulded Casing.....	2.50	2.00	2.50	2.50
7¼-in. Moulded Base.....	3.00	3.00	3.50	5.00
½x9¼-in. Moulded Base.....	4.00	4.00	4.00	6.00
1½x4½-in. Moulded Window Stool.....	2.50	2.50	3.00	4.00
Miscellaneous List—	Per M	Per M	Per M	Per M
		rc \$3.50	\$4.00	bc rc 4.00
Shingles, No. 1.....	2.75	3.00	3.75	*
Shingles, No. 2.....	2.25	*	4.50	6.00
Shingles, Fancy.....	3.50	3.60	5.50	wp 5.00
Lath, 4 ft., No. 1.....	2.25	2.75	5.00	s 3.75
Lath, 4 ft., No. 2.....	1.50	35.00	30.00	*
Pickets, 1x3 in. x 4 ft. 6 in., dressed.....	30.00			
Pickets, 1x3 in. x 4 ft. 6 in., rough.....	20.00			
6 in. x 8 ft. Post, split.....		Piece cdr \$0.13	Piece Cdr \$0.25	Piece Cdr \$0.30
8 in. x 8 ft. Post, split.....		.17	.30	.25
8 in. x 8 ft. Post, whole.....		.66	.40	.35
6 in. x 8 ft. Post, whole.....		.25		
Hardware List—		Cwt.	Cwt.	Cwt.
		\$2.25	\$3.00	\$2.85
Nails, wire, common.....		2.10	*	3.00
Nails, cut, common.....		2.65	*	4.00
Nails, wire, fine finishing.....		1.60	3.50	2.25
Sash Weights, cast iron.....		Roll \$1.00	Roll 1.50	Roll \$1.25
Tarred Felt Paper, best 2-ply.....			\$1.00	1.50
Tarred Felt Paper, 3-ply.....			1.25	1.00
Red Rosin, Atlas brand.....			.90	1.00
Red Rosin, durable brand.....			.75	1.00
Black Neponset.....			*	2.00
Masons' Supplies—		Per M	Per M	Per M
Brick, blue, at kilns.....		*	*	*
Brick, blue, at kilns, No. 1.....		*	*	*
Brick, blue, at kilns, No. 2.....		\$7.50	*	*
Brick, white, delivered, face.....		7.00	*	*
Brick, red, delivered, backing.....		7.00	\$7.50	*
Brick, delivered, dry pressed.....		18.00	18.00	17.00
Brick, vitrified, dry pressed.....		*	24.00	*
Lime, best gray.....		bbl. \$1.30	bbl. \$1.25	bbl. *
Lime, best white.....		1.40	1.25	*
Cement, Portland.....		.95	1.85	bbl. 1.70
Plaster, calcined.....		2.40	1.80	bbl. 2.50
Hair, 8 lb. per bush.....		.25	.25	*

NOTE—While these figures are approximately correct at the time of preparing, the continual fluctuations and shifting of prices make it necessary to advise our readers to consult local price lists when making up tenders.—Ed.

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Write for a list of manufacturers of Arkansas Soft Pine. It is worth your while to know if the lumber offered is the lumber we have recommended.

*Ask, also, for a copy of "An Architectural Aid."*

**Arkansas Soft Pine Bureau**  
608 South Dearborn Street, Chicago, Illinois





# Dick and Pete—Likewise a Typewriter

*F. Ford*

DICK and Pete had both sent in bids for the new schoolhouse that was to be built in Boontown. After their bids had been mailed Dick and Pete confidentially compared figures. The comparison showed that Pete's bid was the lower by a nice little sum.

Pete was in high feather. "I sure got



After Their Bids Had Been Mailed They Compared Figures

you skinned this time, Dick," he cried gleefully.

"Oh, I don't know," replied Dick. "You remember the statement, 'The lowest or any bid not necessarily accepted,' don't you?"

"Sure, I remember it," answered Pete. "But believe me, money talks every time and talks loud. The lowest bidder will get the job and that's a cinch."

"I don't see how you got your figures so low," said Dick.

"Well," answered Pete, "I sat up near a whole night whittling things down. I did so blame much figgerin' I could hardly make out my estimate sheets, my fingers were so tired."

Dick said nothing for several minutes.

Pete looked slyly at him and thought he had his friend treed, when suddenly Dick burst out, "Pete, if this job is between you and me, I'll get it."

"Yes, you will—nit," said Pete. "This is one time where I got you beat hands down. What'll you bet on it?"

"Never gamble, Pete, but if I don't land this contract, provided it's between you and me, I'll buy you a new Stetson hat."

"You're on," said Pete. "Better order the hat right away. Seven's my size."

Not long after, the contract was awarded to Dick. Pete was a very sick man. He knew there was no such thing as a pull, because the schoolhouse was to be built in another county and both men were strangers there. So, one evening he wandered over to Dick's house to try and solve the mystery.

## ESTIMATE

For Public School

School Section # 1.

Kaladar, Mo.

J. P. Ennon

Architect

Submitted by

**Richard Smith**

CONTRACTOR

Rushville - Missouri

Conditions

Appearances Count for a Whole Lot

"Dick, how'd you know you'd land that contract, if it was between you and me? I can't sleep for thinking of it. I give it up."

"That's easy," answered Dick. "At first

# No Paint— No Repairs—Just Wear—Use PEARL for Screens

What's the use of screening with a wire cloth you know will have to be repaired, repainted or renewed in a season or two at most?

Practice *real* economy. Screen with genuine Gilbert & Bennett PEARL Wire Cloth. Rust, *not* wear, ruins screens. PEARL Wire Cloth is as near rust-proof as metal can be made, and consequently as near wear-proof as a screen can be.



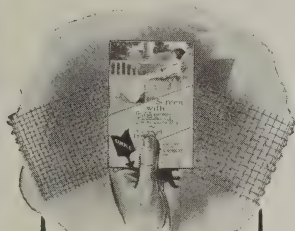
*For Screening Doors, Windows  
and Porches*

Made in Two Weights—Regular and Extra Heavy

Smooth surfaced and with a metallic lustre, PEARL is beautiful as a screen can be. Easy on the eyes and less visible the longer it's used.

Don't be deceived. There can not be a "just the same as PEARL." The manufacture and application of the non-crack, non-chip coating from which it derives its wonderful rust-resisting qualities is a secret process, the exclusive property of this company.

But to be sure of PEARL wear you must get genuine PEARL Wire Cloth with two Copper Wires in the Selvage and the Round Tag bearing the Gilbert & Bennett name on each roll.



**FREE Samples and  
Booklet**  
Write our nearest office.

Write our nearest office for samples of both Regular and Extra Heavy PEARL, full details regarding same, and the name of nearest dealer.

*The Best Hardware Dealer in Your City Sells "PEARL"*

**The Gilbert & Bennett Mfg. Co.**

*Established 1818*

Dept. S, 277 Broadway, New York  
Georgetown, Conn.

Dept. S, 38 S. Dearborn St., Chicago  
Kansas City, Mo.



I naturally thought you'd get the job, because your bid was low. But when you told me you could hardly make out your estimate papers because your fingers were so tired from figgerin', I knew they would accept my bid before yours. In the first place, my estimates were made on my printed stationery, and I knew you do all your writing and figgerin' on any old tablet of the children's that's lying around. Then I knew that, at the best, you are no fine penman. No man who works hard with his hands can be, and I was sure that your estimate papers would need some wrestling with before anyone could make them out. I shouldn't be surprised if the members of that building committee lost their religion before they got through with your bid, Pete. Now, mine were made out on this little typewriter you've made so much fun of, and I knew what with my letterheads and typewritten estimates, my bid would look a thousand per cent better than yours."

"Huh!" grunted Pete.

"Now, looks count in business as in everything else, and though you're as good

a workman as I am, Pete, I knew these people would think I was the better man because my correspondence and papers looked far more business-like."

"Say, Dick, this building business is going to the dogs, anyhow," mumbled Pete.

"Not at all," said Dick. "Only the best builder isn't the fellow who can drive the most nails in a day. Appearances count for a whole lot. For my part, I never even ask for a catalog or a sample without I typewrite my request on my printed letterhead, for my letter represents me, and though I'm not braggin', Pete, I think I'm worth a decent letter."

A stepladder furnished by the master for the servant to stand upon while working is a place to work or an appliance, not a tool with which to work, and the rule that the master is not required to inspect simple tools does not apply in an action for injuries caused by a defect in the stepladder.—*Puza v. C. Hennecke Company*, 149 N. W. (Wis.) 223.



How'd You Know You'd Land That Contract

# CYPRESS "The Wood Eternal"

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is probably the best wood on the market for trellises, arbors and pergolas, because it is not necessary to tear down the vines to repaint the wood. Cypress may be left to "weather" into its fine natural effects, or it may be painted once every 91 years if desired.

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Let our "Carpenters' Department" help YOU. Our entire resources are at your service with Reliable Counsel.  
We invite any Correspondence with a serious purpose in it.

## Southern Cypress Manufacturers' Association

1212 Hibernia Bank Building, New Orleans, La., and  
1212 Heard Nat'l Bank Bldg., Jacksonville, Fla.

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INSIST ON CYPRESS AT YOUR LOCAL DEALER'S. IF HE HASN'T IT, LET US KNOW IMMEDIATELY





# A New Door Fitting Machine

The cost on a large building may be divided into material and labor. The reduction of either means an added profit. Each of these items may be again divided into numerous subdivisions, for instance, the labor may be divided into the work in the shop and the work in the field. The contractor must be careful that a saving in the shop does not cause extra cost in the field or on the job. Altogether it is a nice puzzle to work on, with the certainty that if one solves the problems, it means a saving of money and an increase in profits. There are a certain number of places where one class of work must fit into another. In hanging and fitting doors it is possible, theoretically to make a door exactly the right size to fit a given opening, and to set up the opening exactly right to take a certain size door. Practically, it doesn't work out, and so doors are made a trifle large, to be cut down to size as they are fitted.

There are several reasons why the cutting and fitting at this point takes time and costs money. The fit must be exactly right, and the door must be the exact shape of the opening. To get this condition means, by usual methods, several tries at it, each time coming a little closer. At last the carpenter gets the fit he desires, and then applies the hinges, locks, etc. Has he wasted any time? Not a bit, and yet with heavy doors, several hours slip away. Is there any way the carpenter can save time? Not by ordinary means, for his tools are sharp and his muscle good.

After long and patient labor we are pleased to present to the general contractors and builders a machine for fitting doors on the job. It is a mechanical device built on lines which insure a perfect and true fit, better in every way than can be done by hand. It insures a uniform clearance all the way around and also gives the lock side of the door any bevel desired. When the required clearance and bevel is obtained by adjusting the setting parts on the first door, we guarantee the same uniform results on any door in the building, whether it be one door or one thousand. This point will be appreciated by the contractor and architect as well. Past experience will tell him what success he has had with some

men who claim to be able to fit a door, while this tool makes a poor fit impossible.

The contractor has paid from 40 cents to 50 cents and even more for fitting a hardwood door and this machine does it perfectly in from five to six minutes and at a cost of about 10 cents per hardwood door. Fitting a softwood door costs about half this



Fig. 1. Measuring the Opening

amount. The door is placed on a pair of trestles. Then an adjustable frame is placed in the opening the door is to fill, set tight, locked and then placed flat on the door. Props set from above hold the adjustable frame firmly in place. The above operation complete does not consume more than a minute or a minute and a half. The ma-

# Acme Steel Levels

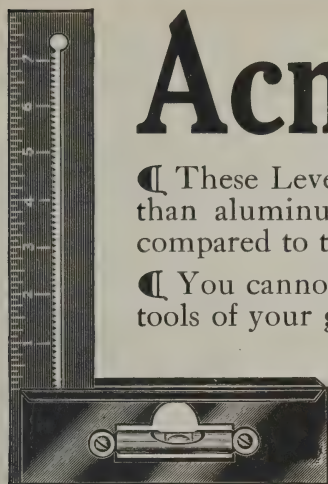
☞ These Levels cost no more than wood, and much less than aluminum or cast iron, neither of which can be compared to these, either for appearance or utility.

☞ You cannot afford to dub along with the old-fashioned tools of your grandfather's days—get up-to-date or you will be counted out.

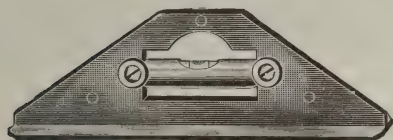
☞ With these levels you can easily establish any grade either in degrees or inches rise to the foot—or find any grade already established.

☞ These Levels are easily adjusted, should you think they need it. No excuse for having your work on a twist or out of plumb.

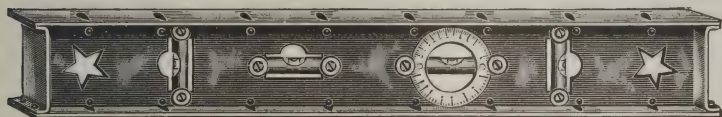
**Your dealer should handle these Levels. If he does not, write us, and we will have our jobber see that he does.**



Acme Square No. 7.



Acme Baby Level. Easily the best small level on the market.

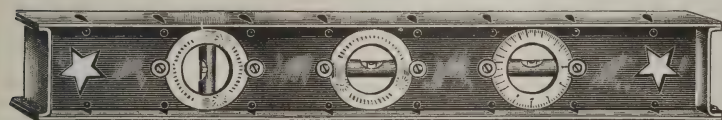


Acme Level No. 2.  
22, 28 and 30 inches long; give length desired when ordering.



Acme Level No. 4.  
22 and 24 in. long; give length desired when ordering.

Acme Level No. 5.  
36, 42 and 48 inches long.



Acme Level No. 1.  
26, 28 and 30 inches long; give length desired when ordering.



*Ask your dealer or us for prices*

## The Acme Level Co.

1155 Grand Avenue

TOLEDO, OHIO





chine is then started. The carpenter walks around the door passing the machine over the edge of the frame. The gauge and the clearance required is obtained by adjusting the cut on the first door. And this applies to every door that is to be fitted to the same sized opening. The cut will be absolutely perfect.

When the bevel side is reached, a lever is moved, setting the cut to the required bevel and this, too, will be retained throughout the entire job, unless the setting is changed. The inventor being a practical interior finish man, having handled both large and small contracts, designed the tool to save money for the contractor and to make door fitting an easy and pleasant operation.

Suppose for example the cost of fitting a hardwood door is 40 cents. Many buildings require a thousand doors fitted. Now if a door is fitted at a cost of 10 cents then the saving is 30 cents a door, or \$300 per thousand; not only a saving in cost but the assurance of a perfect fit, uniform clearance or bevel and an agreeable job; and the machine has more than paid for itself on the one job. The cost of this machine will be saved many times over on future contracts.

solid steel and have rawhide intermediate gears to prevent wear. All bearings being standard ball bearings, the machine uses very little power. This tool, the manufacturers state, will be a revelation as there never was a machine that would save as

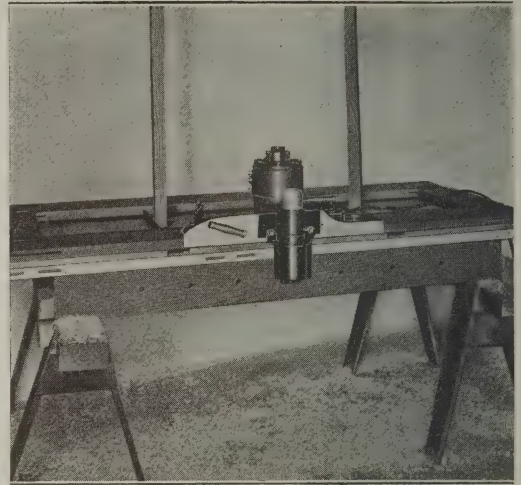


Fig. 2. The Door Templet and Tool in Place

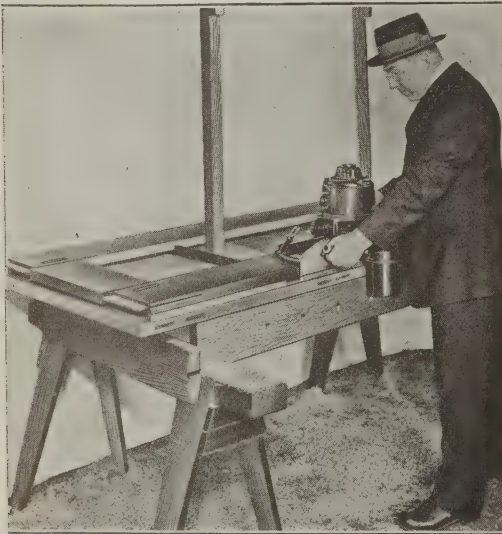


Fig. 3. The Tool at Work

much money for the same investment as this one will. The actual saving is over 300 per cent in cold cash, and the quality of the work done can only be appreciated after seeing the machine in operation. The fitting of softwood doors is a mere nothing and the edges and end wood are as smooth as though run through a sander. This tool also has a bore in the end of the spindle so an auger bit can be inserted. It also has a thread on the end of the shaper collars and makes an ideal shaper and a perfect jointer for long joist or moulded edge work. The fitting of sash or windows is a simple task with this tool and we find that wherever it is sold it is used for a multitude of purposes as rip-saw grooves, shaper, jointer, sander, boring machine, and so on down the line. The machine is manufactured by the Brotherhood Door Fitter Co., 51 Third St., Milwaukee, Wis. Prices and further information will be furnished by writing them.

The tool is fully guaranteed and cannot get out of order. It can be taken into any building where there is electricity and plugged into any lamp socket. It is then ready for use. The gears are cut from the

Efforts of the owner to obtain unauthorized alterations of the work by the contractor's foreman do not constitute a breach of the contract by the owner.—*Parr v. Howell*, 82 S. W. (W. Va.) 126.

# "HETZEL'S" STANDS FOR THE BEST USE

## *The Elastic Rubber Roof Cement That Saves 200%*

Hetzel's Elastic Rubber Roof Cement will last twice as long as any solder method, and prove more efficient.

Adheres to any surface, and permanently. Its elasticity prevents cracking and hardening.

Excellent for leaky roofs.

Can't be equalled for pointing up leaky chimneys, windows and skylights.

Exceptionally good for setting slate and tile.

Comes in Gray, Brown, Black, Green and Red. All colors permanent.

## *The Damp-Resisting Paint That Never Fails*

Used generally throughout the U. S. for keeping brick walls dry.

May be used on interior or exterior of any walls to which plaster is to be applied.

Insures against moisture and staining.



It does the work where other paints fail.

Read the following (one of many similar) testimonial:

ESSEX CONSTRUCTION COMPANY, Inc.  
85-87 Academy St., Newark, N. J.

November 18, 1913.

J. G. Hetzel, Newark, N. J.

Gentlemen:—We are in receipt of your letter of recent date asking our opinion of your Damp Resisting Paint. In replying to same must state that we can highly recommend it to those desiring its use. We have found it very valuable in cases where other paints have failed to do the work.

Respectfully yours,  
(Signed) Essex Construction Co., Inc.  
Per William Bayles.

*Write for Samples, Prices and Particulars Now*

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LOS ANGELES: The Paraffine Paint Co.

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Standard Typewriter at less than half original price. Every contractor who writes letters needs a typewriter.

**Standard L. C. Smith**  
(200,000 In Use)

This beautiful visible writing typewriter with every late feature and modern operating convenience at less than half the original price. Complete operating instructions Free so you or any member of your family can rapidly learn to operate it. I want to send you full particulars about my special



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explaining how you can get this well-known guaranteed typewriter on five days' Free Trial and on your own terms. Just send me your name and address for complete detailed description of typewriter and special credit plan. Address

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## A Change in Firm Name

For many years the Witte Iron Works Co. was known as manufacturers of high grade engines. Their reputation in this regard was due largely to the excellence of the design and proportion in the engine as well as to the care used in their manufacture and their liberal policy toward their customers.

In order that their name might better signify their business they recently decided to change the name to the Witte Engine Works. Their office and factory still remain at 3189 Oakland avenue, Kansas City, Mo., and the entire management of the business continues as heretofore. This explanation of the name is given in order that there may be no misunderstanding and that every one will understand that there is but one concern operating under this name.

The Witte Engine Works have prepared a book on "How to Judge Engines" which is of great value to those about to purchase an engine as well as to those who already are operating one. It will be sent to our readers on request.

## June Bargain

**25¢**  
Post-  
paid



6-in. drop forged, slip joint pliers, for gas pipe and all kinds of nuts. Send for our new No. 7 Hardware Catalog, free.

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Dept. 7 177-179 N. Clark St., Chicago



## Hess MEDICINE LOCKER

**THE ONLY MODERN, SANITARY STEEL Medicine Cabinet**

or locker finished in snow-white, baked everlasting enamel, inside and out. Beautiful beveled mirror door. Nickel plate brass trimmings. Steel or glass shelves.

### Costs Less Than Wood

Never warps, shrinks, nor swells. Dust and vermin proof, easily cleaned.

### Should Be In Every Bath Room

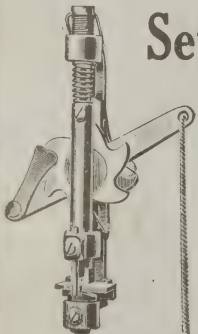
Four styles—four sizes. To recess in wall or to hang outside. Send for illustrated circular.

**HESS, 907 L Tacoma Bldg., Chicago**  
Makers of Steel Furnaces. Free Booklet.

The Recessed Steel  
Medicine Cabinet

## Sets Saws Right

**The Uniform Saw Set**



gives an even set to each saw tooth. A mechanical device that operates by foot tread, leaving both hands free. Will set any saw. Can be arranged to set band saws as narrow as 1/4 in. Carefully machined and well made. Will last a lifetime.

**Price \$1.50**

**Agents Wanted Everywhere**

**J. O. Pettey - Belvidere, Ill.**

## Wall Board Samples

The contractor must have samples of materials showing the finishes possible as well as the natural texture and composition. This should supplement such catalogs and literature as the manufacturer gets out for the benefit of the contractor and his clients.

The Roberds Mfg. Co., 104 Railroad avenue, Marion, Ind., has prepared a book of useful information for contractors and builders and this is given free to our readers. Those expressing a desire for a beautiful panel showing their Wall Board in actual color designs can obtain it at the same time. The panel shows some of the many finishes possible while the book will give valuable information about Wall Board as well as other forms of construction. Every one of our readers should have both the book and the samples.

## A Lucky Number Catalog

Catalog No. 7 issued by Cobb-Whyte-Laemmer Co., 177-179 No. Clark street, Chicago, Ill., is a particularly lucky one for our readers. It contains illustrations, de-



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LETTERS YOU WRITE  
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Advertisers' Section

# 224 page Plan Book and year's Consulting Service given FREE with this set!



This is one of the most attractive offers ever made. We give free to every purchaser of our newly revised **Cyclopedia of Architecture, Carpentry and Building**, a copy of "Modern American Homes," the most complete and up-to-date plan book procurable. It contains plans and specifications for 168 different structures, including excellent exterior and interior views, detailed estimates, etc. Designed by the leading architects of this country, it includes city, suburban and country homes, bungalows, summer cottages, tent houses and camps, also apartment houses, garages and various public buildings. Contains 224 pages,  $9\frac{1}{2} \times 12\frac{3}{4}$  inches, and 426 illustrations. Printed on heavily enameled paper and substantially bound. With this great plan book in your shop or office you are prepared to figure on any job, no matter how large. No need for the prospective builder to consult an architect when you can offer him his choice of practically every type of the modern American home. This saving of the usual architect's fee should get you the business.

In addition to this we give free with each set a year's consulting membership in the **American Technical Society**. Through this service you have the assistance of the most expert architects, structural engineers and draftsmen in America. They are no farther from you than the nearest mail box. They stand ready to solve your perplexing problems, to offer suggestions, to point out the things you should avoid. In fact they enable you to compete with the biggest and most experienced men in the construction field.

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This is the clearest, most practical and complete work ever published on the practice and possibilities of the modern building trades. It covers everything from cottage to skyscraper—from the plans to the completed structure. It includes wood, stone, steel and reinforced construction; estimating and contracting; a study of the Greek and Roman orders; interior finishing and decorating; and modern house lighting and sanitation. The work of forty experts, it can be depended upon to give you the information you desire on any and every subject.

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**AMERICAN TECHNICAL SOCIETY, Chicago, U.S.A.**

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Book and year's Consulting Member-

ship included free), or notify you and

hold books subject to your order. Title

not to pass until fully paid.





## Pitless Auto Turntable

**"All Steel Runways Ball Bearing"**

They will last a lifetime; can turn it with your little finger. For any light car up to 108-inch wheelbase. Built like our **Standard Turntables**, that have stood the test for eight years. On account of low cost of steel and increased output we are able to make this price, yet it may only be temporary. Send your order now—don't wait.  $\frac{1}{2}$  cash, balance B-L.

**FORD SPECIAL \$37.50**

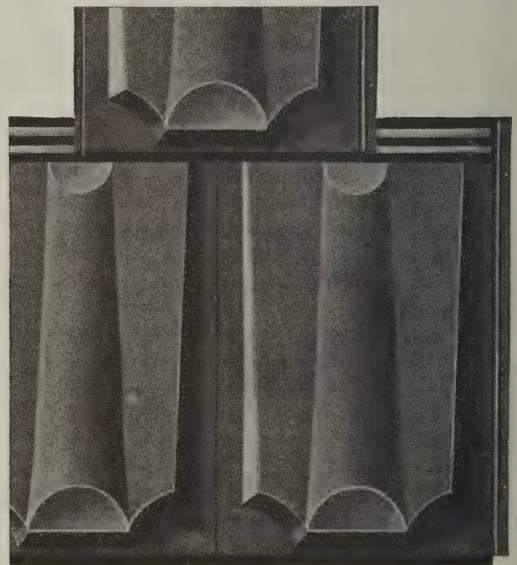
Write for New Catalog N

Pitless Auto Turntable Co., 2420 Broadway, Kansas City, Mo.

scriptions, sizes and prices of practically every tool and piece of apparatus which the contractor or mechanic is apt to need in his business. Starting with wheelbarrows it covers the contractors' equipment such as shovels, picks, wrenches, sledges, pulley blocks, rope, saws, chisels, vises, drills, hose, dumb-waiters, lanterns, salamanders, building and roofing papers, iron and lead sash weights, nails, wire, trucks, brooms and brushes, ladders, weatherstrip, locks and hardware, etc. As an instance of the completeness of the catalog we note that four pages are given to screen and storm sash hardware. We believe that few of our readers can afford to be without this Lucky catalog which will be sent to our readers on request.

### The Berco Metal Shingle

A metal shingle of new design just brought out by the Berger Mfg. Co., Canton, O., and described in their special catalog DN, is of interest to our readers par-



ticularly as great efforts are being made throughout the entire country to reduce the excessive fire loss as well as to produce a roof which will harmonize with the rest of the building and be ornamental as well as useful.

The general design and appearance of the Berco Metal Shingle is shown in the cut herewith and our readers will have no difficulty in appreciating its value.

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Mr. Home Builder, that the cellar of your residence can be made absolutely and permanently watertight by the simple application of "finish of Portland Cement with Bitu-Mortar Waterproofing Compound added, over the inside walls and floor?"

Let us tell you about our products.

**The Bitu-Mortar Waterproofing Company**

**BITU-MORTAR**  
**WATERPROOFING**  
**WATERPROOFS PERMANENTLY**

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—Double Mix!  
Double Capacity!  
Double Efficiency!

Concrete should be mixed **dry** before being mixed wet. The "**Olsen**" provides for this; others don't. That's why the "**Olsen**" has a double drum.

Note the construction; malleable and steel castings; tubular frames and axles; heavy steel chain drive; low feed hopper; high discharge.

Write for Booklet and Prices

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1342 Murray Building      GRAND RAPIDS, MICH.

Send 25c in silver (and 10c postage) for our big \$1 book of plans. "**LOW COST MODERN HOMES**," with houses from \$1,000 to \$3,000.

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LETTERS YOU WRITE  
ADVERTISERS. IT HELPS

### School Furniture

While a great many of our readers are prepared to take contracts for any style of building, it is a fact that those who make a specialty of any one line, achieve an unusual success in that business. Those who are giving a large part of their time to the construction of school houses, theaters, moving picture buildings, etc., will appreciate the catalog of the Steel Furniture Co., 1483 Buchanan avenue, Grand Rapids, Mich. This catalog shows a great variety of seats, desks, chairs, etc., for practically every purpose enumerated above. The catalog also contains details of the agency proposition which the Steel Furniture Co. is making to our readers. It should be of great interest to them as it may be the means of working up a well paying business in this line.

### More Help for Hustlers

Contractors who handle their own painting jobs, as well as our painter friends, will be more than glad to have a snappy little magazine called the "Carter Times." It's a publication that is mailed free to interested parties and the April number has several splendid articles—for instance, "Interior Finishing," "Decorating Old Floors," "Tinting Colors" and "Tiffany Wall Glaze"—a phase of decorative art that is commanding much favorable comment just now. You naturally want to make your houses look their best; you also want to talk intelligently to your customers. You will find it a business advantage to be able to give suggestions.

Write a few lines to the Carter White Lead Co., West Pullman, Station "B," Chicago, Ill., and they'll send you the "Carter Times."

### Cutting the Building Cost

In sending out a circular to their customers, the Chicago Millwork Supply Co., 1423 W. 37th St., Chicago, Ill., call attention to the saving which can be accomplished in lumber and millwork through the use of this catalog. The pages show a most complete line of sash, doors, frames, flooring, colonnades, screens, wall board, store fronts, metal work, plumbing goods, hardware, paints, art glass, etc. The catalog also contains an outline of the several plans under which goods may be ordered and which will give the customer the greatest

Advertisers' Section

We want to get you better acquainted with the

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**PLAIN  
SCREW  
DRIVER**

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not to turn  
in the  
handle*

*You can't  
do it—  
try any  
way you  
like*

**The best  
proposition  
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**15 Sizes**

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Let us send you the "YANKEE"  
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**North Bros. Mfg. Co.**  
Department N, Philadelphia, Pa.

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**Carloads or Less**

# WHITE PINE

**LUMBER**

**SASH    FRAMES    FINISH**

STANDARD GRADES                      LOW PRICES

**Also FIR and CEDAR**

In straight or mixed cars direct from our mill on the Pacific Coast

**NORTHWEST SUPPLIES COMPANY**

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protection. The Chicago Millwork Supply Co., advise us that they have a catalog for every one of our readers and we trust they will all be sent for.

### A Sufficient Sample

A great many people are satisfied to take the word of almost anybody that goods are satisfactory and will do the work claimed for them. Others adopt a "Show Me" policy requiring the stiffest satisfaction before any considerable quantity of material is ordered.

Messrs. S. C. Johnson & Son, Racine, Wis., are not only willing but anxious that our readers should try their materials before accepting them at the manufacturer's word. They are prepared, therefore, to send liberal samples of their paste wood filler of such color as the reader may desire as well as their booklet on "The Proper Treatment of Floors, Woodwork and Furniture." Our readers will, therefore, be able to try out these materials fully and satisfy themselves that they are just what they need.



**SEND 10c in stamps for Catalog T 40** on Exterior and Interior Columns, or for our beautiful Pergola Album T 28, illustrating pergolas, garages, lattice fences, veranda treatments and garden accessories.

**HARTMANN-SANDERS COMPANY**  
Exclusive Manufacturers of

**KOLL'S  
LOCK  
STAVE**



**PATENT  
JOINT  
COLUMNS**

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New York Office: 6 East 39th Street

### Screen Comfort

There are few places about a building which can be of more annoyance to the owner and tenant than a poorly fitted window screen or screen door. The contractor must be extremely careful in fitting screens in order to keep from trouble in the future. When one considers the hard service given screen doors, it will be realized that it is necessary to provide strong hardware that will stand the use and abuse and still do its work, that is to keep the door closed and keep out the flies and other insects.

The Watrous Acme Mfg. Co., Des Moines, Ia., in their latest catalog show the various styles of hangers, hinges, locks, latches, etc., which they have devised especially for screen doors and sash. The catalog will indicate which of the various styles are best suited to the particular places which the contractor has in mind.

### Proportioning Materials

It is becoming realized that to secure the best results it is necessary to carefully proportion the materials used in making concrete. While nature has been lavish in providing the materials, it is frequently

# BIRCH

## INTERIORS

We do not wish to create in your mind any question respecting the worth of any wood. We do want to make you better acquainted with Birch. Birch Book "D" tells how to design and how to finish Birch interiors, and why you should use Birch. It will be worth much to you in dollars, cents and satisfaction. *Send today for copy of the latest edition.*

**Northern Hemlock & Hardwood Manufacturers Assn.**  
Department D                      Oshkosh, Wisconsin

**Standard and Special Designs in Interior and Exterior Ornaments**

In Plaster, Cement and Composition

Send us your blue prints for fine residence, theater and other public building work. Beautiful designs; best workmanship. Unusually low prices.

**Architectural Supply Co.**  
Harry A. Lang, Prop.  
420 High Street                      Fort Wayne, Indiana



 **PUT THIS DOME ON LETTERS YOU WRITE ADVERTISERS. IT HELPS**

# An Important Message— and a Helpful Free Bi-Monthly Magazine for Contractors

Every contractor knows that no other wood works so easily under his tools, holds in place so perfectly without warping, checking, or opening at the joints—or lasts so long as old-fashioned

## WHITE PINE

He knows that no other wood compares with it for the outside of a building, where it is exposed to and must withstand all kinds of weather.

But for some reason an impression prevails that the supply of White Pine is practically exhausted. And many contractors have come to believe it.

The fact is—White Pine is still abundantly available today, as it always has been, in all grades and in any quantities desired, and can be purchased in all markets at reasonable prices, when considering its value as a structural wood.

If the Lumber Dealers supplying the material for those for whom you are building are at any time unable to furnish it, we would appreciate the opportunity of being helpful in securing it.

## A Magazine Every Contractor Should Have

Next month we will begin the publication of a bi-monthly architectural White Pine magazine for free distribution among contractors and architects. Every issue will be full of valuable and helpful information for contractors and builders.

If this magazine does not reach you, kindly advise us and we will be pleased to place your name on our mailing list.

Address, WHITE PINE BUREAU,  
1637 Merchants Bank Building, St. Paul, Minn.

### Representing

The Northern Pine Manufacturers  
Association of Minnesota, Wisconsin  
and Michigan, and The Associated  
White Pine Manufacturers of Idaho

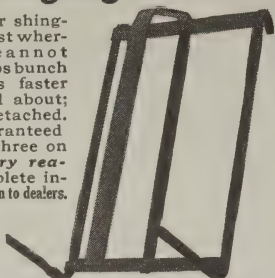




## Richards Shingling Bracket

Great convenience for shinglers. Holds shingles just where wanted. Wind cannot blow them away. Keeps bunch in good order. Allows faster work. Easily moved about; weight bar can be detached. Strong, well-made. Guaranteed. You can use two or three on your jobs. Price very reasonable—send for complete information. Liberal proposition to dealers.

Richards  
Shingling Bracket Co.  
Toledo, IOWA



## Miller's Screen Wire Stretcher

Will help you make screen doors and windows in half the time. Insures a snug-fitting, evenly stretched screen without sag. Saves its own cost. Operated by foot and holds wire tight until tacked.

### Write Now For Circular and Price

on this and on my Sliding Arbor Cut-Off Saw, Clamping Bench and Laying Out Table, Moulding Mitre Cutter, etc.

A. N. MILLER, 750 38th St., Milwaukee, Wis.  
Manufacturer of Special Sash and Screen Making Machinery



## A SHINGLING HATCHET WITH POSITIVE GAUGE

Carpenters and Builders—Here is a hatchet you can do some fast shingling with—No. 144 (oval head, 169 points.) Gauge is positive—cannot slip. Clamps on with screw; gauge is readily changed. This hatchet is also made with flat head No. 44, 81 points, milled. Price of either, \$1.75 postpaid. We make a complete line, and the best, of Lathing Hatchets, from 64 to 225 points. Prices \$1.40 to \$1.75. You get full money value in a Sayre Shingling or Lathing Hatchet. You can be positive of that. At your dealers or sent direct.

L. A. SAYRE & SON  
340 Mulberry St., Newark, N. J.

## Pearson's Automatic Shingle Nailer

Pays for Itself on the First Job  
Very Fast On Any Pitch Roof



2 sizes—BLUE for 3d common No. 14 gauge wire nails. RED for 3d galvanized No. 13 gauge, 1 1/4 inch wire nails.

Money refunded if not as represented

PEARSON MANUFACTURING CO.  
Makers of Hand Nailing and Tacking Tools  
Robbinsdale - - - Minnesota



PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS

found that the proportion of fine and coarse sand and gravel is not the best for making the strongest concrete. It is, therefore, necessary to carefully wash, screen and grade the sand and gravel and

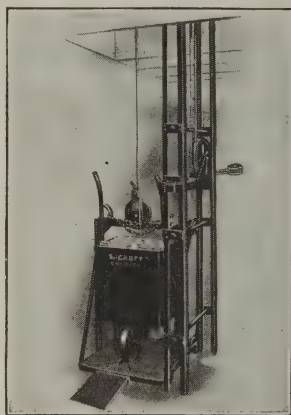


Fig. 1. Loading the Cage

use such quantities of each as will give the required strength.

The H. B. Sackett Screen & Chute Co., 1689 Elston avenue, Chicago, Ill., have a machine for doing the work mentioned above and doing it rapidly and with little labor. The use of this machine will actually save its cost in a short time, due to the cement which can be saved when the right proportion of materials are used. A special screen circular describes the above machine in detail, gives prices, etc.

The H. B. Sackett Screen & Chute Co.,



Fig. 2. Power for the Hoist

also make a builder's hoist particularly adapted for use on residences and apartment houses. They claim that this hoist can be erected so easily that it can be economically used on practically any building,

Advertisers' Section

# KWIK-KUT

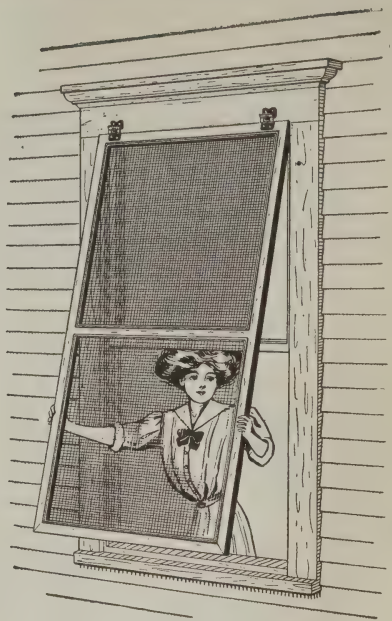
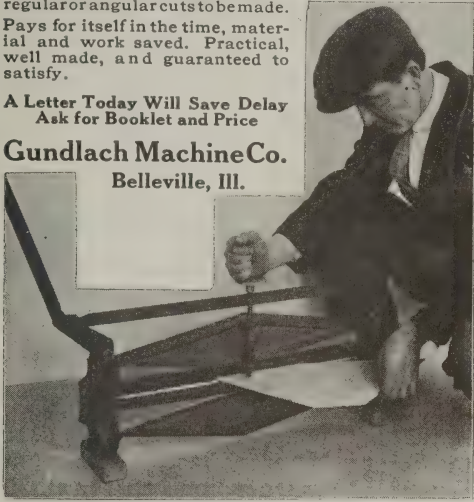
## Asbestos Shingle Cutter

A necessity on all roofing jobs where Asbestos Shingles are used. Cuts shingles for hips, valleys and mitres quickly and cleanly without damage or waste to shingle or remnant. A punching attachment saves drilling nail holes by hand; also enables irregular or angular cuts to be made.

Pays for itself in the time, material and work saved. Practical, well made, and guaranteed to satisfy.

A Letter Today Will Save Delay  
Ask for Booklet and Price

**Gundlach Machine Co.**  
Belleville, Ill.



## It Is Easy

to hang full length screens  
with

## National Automatic Screen Hangers

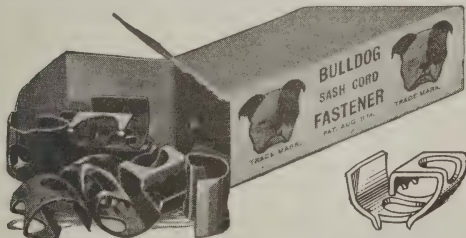
Simply rest top of screen against blind stops inside of casing and slide screen up. It will hook automatically.

These hangers are easily attached and will hold screen firmly in position and prevent rattling.

Ask your dealer for National No. 80 Automatic and be sure you get them.

General Catalog Mailed Free  
Upon Request

**National Mfg. Co.**  
Sterling : : : : Illinois



Pat. Aug. 11-14

## Get Yours NOW!

*This Box is FREE*

Just send your name and address and get a sample box containing four "Bull Dogs" to practice on, and a model sash and weight to show how they are applied. For cord or chains. Adjusted in a jiffy. Quicker and easier than tying knots. Be the judge of

## "Bull Dog" Sash Cord Fasteners

They save time and at least 3 feet of cord on every window. Knots slip. "Bull Dogs" can't. Give endless satisfaction. A real economy. Get your box now. Write today.

**The Allen Company**  
197 Pearl St., Hartford, Conn.







## Diehl's BIG-FOUR Couplings

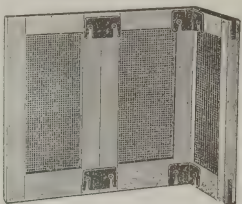


"Go Like 231"

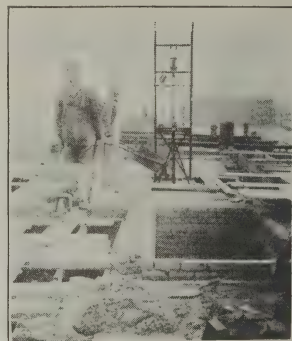
Make it easy to put up or take down storm houses, porch screens, or wherever a rigid corner or coupling is desired; illustrations show styles of couplings.

Price, \$2.40 per gross, from your dealer or direct; write for catalog on other hangers and hinges. *We're cheery and prompt.*

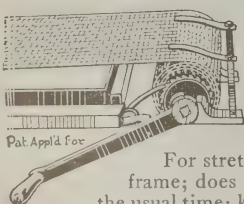
Diehl Novelty Co.  
Glenbeulah, Wisconsin



while on a building of any size its use is almost imperative. It can be operated in a space of 24x54 inches while its extension from one floor to another requires only



about fifteen minutes. It would seem like this would be an ideal hoist for National Builder builders.



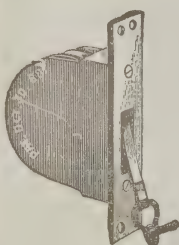
Pat. Appl'd For

## SCHILLI Screen Stretcher

For stretching screen wire on the frame; does the work in one-fourth the usual time; keeps the wire taut and of a uniform tension on every square inch. Cuts down labor costs—makes every job pay more profit—greater satisfaction to customers. Simple, compact, durable. Write for description and prices.

M. L. Schilli Mfg. Co., Pierron, Ill.

## Caldwell Sash Balance

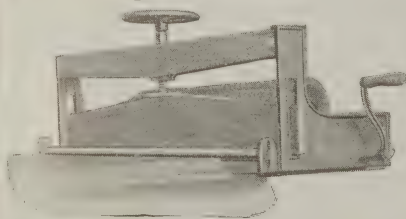


Does away with weight and cords and **vastly** more durable. Makes sashes work perfectly. Permits greater window space in new work, as box frames are not necessary. May be applied to old windows without altering sashes or frames.

Write for Circular to

Caldwell Mfg. Company  
2 Jones St., Rochester, N. Y.

## The ONLY MACHINE For Stretching Wire Cloth on Frames



Does the work quickly, evenly and without waste

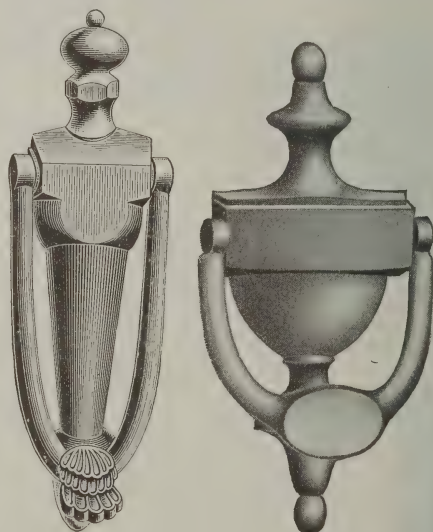
Can be used by anyone. Will hold any width to thirty-six inches; larger sizes to order. Price Ten Dollars. If not satisfactory may be returned in thirty days.

J. F. Schafer - - Mount Pulaski, Illinois

## Door Knockers

A well designed and finished front door, with a bronze or brass knocker, makes an unusually nice combination and something that always attracts favorable comment.

The door knockers shown in this article are listed in the Rehm Hardware Com-



Modern Door Knockers

pany's new No. 6 catalog. Design No. 8241 is a cast bronze metal, polished, dull brass finish knocker 8 $\frac{1}{4}$ x2 $\frac{3}{4}$  inches and No. 8242 is the same in metal and finish

Advertisers' Section



PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS



Roof, light olive, sides, dark green. Architects, Freeburg & Fidler, Jamestown, N. Y.

## This Handsome House Roofed and the upper part of the walls covered with "Weatherbest" Stained Shingles

### Beautiful Effects—Extreme Durability

"Weatherbest" Shingles are made only from selected grade Red and White Cedar. They are stained **any shade you desire** with a stain which is not only lasting as to color, but on account of the wood-preserving materials in it, the natural life of the shingle is greatly increased. Shingles come to the job all ready to put on; no brush coat is necessary. Every shingle is stained from **tip to butt**, not merely part length as is usually done. Our scientific, thorough process and materials insure permanent satisfaction.

### Ask us for Free packet sample Shingle Strips

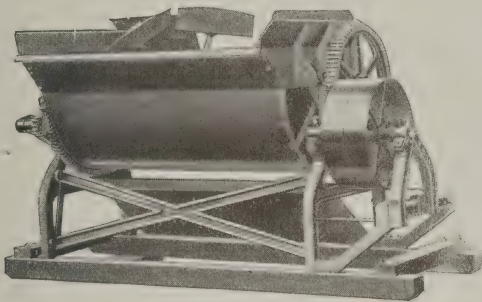
showing colors on the natural wood, enabling you to pick out just the shades you want. Any shingle information gladly furnished.

**TRANSFER STAINED SHINGLE CO.**  
168 Main Street North Tonawanda, N. Y.

Makers also of the superior quality

**"Transfer Brand" Red Cedar Shingles**

Demanded by knowing builders, sold by best lumber dealers everywhere



## Blystone Batch Mixer

*For Plaster - Concrete - Mortar*

Mr. Marshall F. Davenson, Plastering Contractor of New Britain, Conn., says on very conservative estimating he finds his Blystone more than paid for itself on the plastering of one church.

The open drum, the 100% efficiency of the mixing shovels, the simplicity of construction, makes it the best mixer for the plant.

Write for Catalog Today

**Blystone Manufacturing Co.**  
315 Pearl St., Cambridge Springs, Pa.

PAT. 2-25-13



**WE** guarantee all sash weights shipped by us to have perfect eye, clear number and weigh true to mark. Clean castings without lumps.

Careful attention and prompt shipment of special weights.

Price and list of stock sizes upon request.

**Ream Foundry Co.**  
Lebanon, Pa.

### Prices:

1 bbl. Outfit,	\$15
2 " " "	22
3 " " "	33
4 " " "	45



## Make Money on This Gasoline Storage System

The Neptune Gasoline Storage System is just right for private garages, or any building where gasoline is stored. Cut shows our 68V System, a design fully approved by Underwriters, and a big favorite with contractors on account of its thoroughness of construction, ease of installation and low price.

Include a NEPTUNE outfit in your plans, or recommend it to the building owners; add your installation charges to our list prices when making your estimates. Write for catalog on this and other systems.

**FLECK BROS. CO., 40-50 N. 5th Street, Philadelphia, Pa.**



### Neptune Pneumatic Water Supply Systems

For country and suburban homes; operated by hand, gasoline engine or electric power; easily and profitably installed by contractors. Write for complete information and trade terms.







## Closet Pin Brackets

Because they are **needed** in every home is the **reason** for including them in your hardware list.

5-16 Steel Rod bolted at back and front to Heavy Metal Wall Plate—Heavily N. P. and Pol. Substantial; holds 4 suits or dresses. Plate fits on regulation wood closet strip.

No. 103 (10" long)—\$1.60 per doz.  
No. 104 (6" long)—\$1.40 per doz.

Send dealer's name if he doesn't have them and we will sell you Special Sample dozen, Postpaid.

Catalog on other specialties sent on request  
**COLONIAL FIREPLACE CO.**  
Fireplaces and Furnishings  
West 12th St. and Kenton Av., Chicago, Ill.



## STANDARD Fly Screens

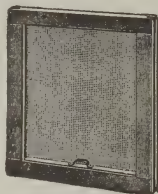
Made of Northern White Pine, with mortised corners. The Standard Shoulder Strip Method holds each strand of wire evenly and firmly. Easy to rewire. Standard Fly Screens are the standard of quality.

### MAKE IT YOUR BUSINESS

to sell Standard Fly Screens and Screen Doors. Send us your specification for estimate. **Write for copy of new catalog.**

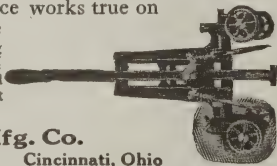
### STANDARD SCREEN CO.

1848-58 Hastings St. Chicago, Illinois



## An Opening for a Mortise Lock Can be Cut in Two Minutes by using the Miller Door Mortiser

Little labor is required, and a perfectly true job is assured. Makes no difference what thickness the doors are, the device works true on them all. Complete with five cutters, covering locks from  $\frac{1}{2}$  inch to  $1\frac{1}{2}$  inches thick. A real time and labor saver. Sent subject to trial.



**A. W. Miller Mfg. Co.**

Riverside, Calif.

Cincinnati, Ohio

Our Butt Mortiser and Rule Gauge for 75 cents. Postpaid

## Build For An Income



Buy a Plan Book of Flat Buildings and plan an income in your old age. Our book gives you ideas from two-family flats to twelve families, and our prices are reasonable.

First edition (right off the press) . . . 50c  
Also a book for residences . . . 25c  
Both . . . 65c

**H. COOK & COMPANY**

720 Ashton Bldg., Grand Rapids, Mich.

but  $3\frac{3}{8} \times 7\frac{5}{8}$  inches in size. Both of these door knockers are very attractive in design and workmanship and the prices are low.

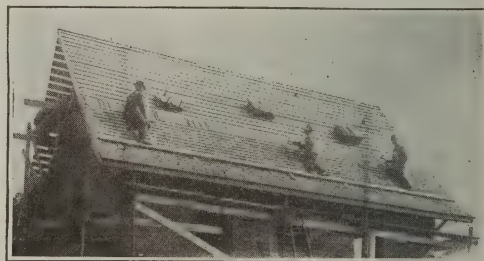
Catalog No. 6 contains 112 pages, all just full of illustrations and descriptions of the latest designs of builder's hardware, standard makes of tools, roofing, etc. A new price list goes with this catalog, which is in pocket size and with prices printed in bold-face type, making it easy to figure from.

Catalog No. 6, like all Rehm catalogs, is easy to specify and buy from. Contractors appreciate this point, for as a rule, nothing is more complicated than the average builder's hardware catalog and price list. But Rehm's is made up by men who know the builder's hardware business from A to Z and who also are aware of the troubles a contractor has in selecting and buying nowadays for the modern home, where, frequently, most every room has different interior trim.

Catalog No. 6 will be mailed to contractors and builders located outside of Cook County, Illinois, by writing the Rehm Hardware Company, 1503 Blue Island Ave., Chicago, Ill.

### Convenience in Shingling

It will generally be found by those carpenters and contractors who make a specialty of shingling are able to do this work much faster than those who only take up the work occasionally. It will further be found that they employ several labor sav-



Using the Richards Bracket

ing devices, calculated to reduce the time of one of the several operations of shingling.

The Richards Shingling Bracket Co., Toledo, Ia., has designed a device to hold a bunch of shingles in place on the roof. Its use does away with the awkward and cumbersome methods usually employed, such as

Advertisers' Section



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LETTERS YOU WRITE  
ADVERTISERS. IT HELPS



# The Difference Between "TROUBLE-SAVERS" and the "Other Kind"—

is that "Trouble-Savers" stand on *two* legs, while the "other kind" have to make shift with one.

If you don't think this is a big advantage—a big *safety* feature—try standing on one leg *yourself*. Then you'll realize why two-legged "Trouble-Savers" cannot "wobble"—you'll get the real reason why

## ***They are SAFE!***

Get down to economy facts. "Trouble-Savers" make scaffolding a building a matter of minutes—not hours as formerly.

They require no nails, bolts or screws; they save using lumber. They save high-priced carpenter labor. No question about "Trouble-Savers" being serviceable

## ***—and Saving***

The ordinary wood scaffolding is good for one building—"Trouble-Savers" are good for a thousand and more. Because they are all steel—nothing to wear out or cause trouble or delays.



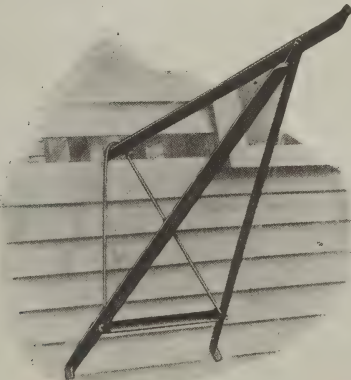
## ***Will Scaffold a Building Like This in 10 Minutes***

It's simplicity itself to hook "Trouble-Savers" around the studding; then, when the boards are placed in position, the scaffold is all completed.

Taking them down is just as easy. When not in use they fold up flat, taking up very little space in the shop.

## ***No Need to Buy***

until you have satisfied yourself that "Trouble-Savers" are the kind you want. We will ship any quantity on approval—freight prepaid—for thirty days' use before you obligate yourself to buy. Don't wait—write us today telling how many you would like to use *on trial*. Further information on request.



## ***"How Many Shall We Send You?"***

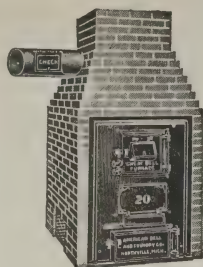
**The Steel Scaffolding Co.**  
**Evansville - - Indiana**

Advertisers' Section

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LETTERS YOU WRITE  
ADVERTISERS. IT HELPS







## A Hot Air Furnace

you ought to know about. Costs no more than a base burner, heats twice as much on about the same amount of fuel. No pipes, no lost heat. Brick or portable. Write and learn.

**American Bell & Foundry Co.**  
Northville, Michigan

sticking shingles between the roof boards, driving in spikes, etc. The further advantage of the Richards Bracket is that it prevents the wind from blowing them away and at the same time the bracket can be readily moved from place to place as the work progresses.

The Richards Shingling Bracket Co., will be glad to send our readers any further information regarding this device, as well as prices, etc.

### Builders' Hardware

Every owner expects the contractor to furnish only the very best kind of hardware for his new building. Just which is best, however, is a matter of some argument and can very easily lead to serious discussions between the contractor and owner, each believing that his ideas are the best on the subject. The contractor who has been careful to secure the new catalog of the Gregg Hardware Co., 44-46 Cadillac Square, Detroit, Mich., will have an unanswerable argument in his favor. He can show the very best lines of hardware for every purpose and can readily convince the owner that he has furnished hardware which will be suitable both in appearance and in service. This new catalog is ready for distribution to our readers and it will show not only the staple lines, but many novelties upon which the contractor should have complete information.

### Business Efficiency

There is no doubt but that our readers are interested in up-to-date business methods as well as modern methods of construction and the latest materials. As business men they appreciate the value of typewritten over hand-written letters and they know that it assures the best attention. In their own business a great many contractors are already using typewriters, although we regret to say that there are many whose letters, estimates, statements, etc., are almost illegible through being written by hand with a blunt pencil or a time-worn pen.

Mr. Harry A. Smith, Rm. 658, 231 No. 5th Ave., Chicago, Ill., is making a special offer to our readers of high grade typewriters especially adapted to the contractor's

**\$50** Saved by buying a **BOVEE ECONOMY FURNACE** **\$50**

At Manufacturer's Prices

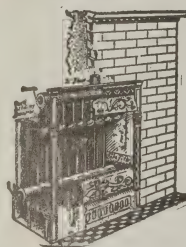
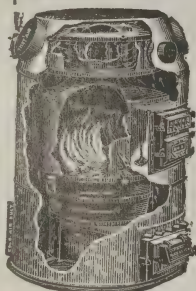
Has a large combustion chamber. Saves one third of the fuel. Has perfect

**Ventilating System**

**The Most Perfect Hot Air Plant Sold**

Send pencil sketch of floor plan for our manufacturer's price and illustrated catalog.

**Bovee Furnace Works**  
60 8th Street Waterloo, Iowa



**Latest Designs In**

## Hardwood

and

## Tile Mantels

**Our Patented Fire Place Heaters Heat One to Five Rooms**

**Write for Catalog, Stating Your Requirements**

**HEITLAND GRATE & MANTEL CO.**  
129 No. Fifth Street - Quincy, Illinois

**\$58.50**

**Heated This 7-Room House From Oct. 1, 1914, to May 1, 1915.**

The owner burns buckwheat coal in his Andrews Boiler and it is attended to only in morning and night. The temperature was kept at 70 or above.



**\$235**

## Andrews Hot-Water Heating

If you are building a new house or are not satisfied with heating conditions in your old house, write for Andrews' Big Book.

**ANDREWS HEATING CO.,** 1471 Heating Building  
Minneapolis, Minn.



**PUT THIS DOME ON LETTERS YOU WRITE ADVERTISERS. IT HELPS**

## A Fine Knife for a Carpenter

For the little jobs that *only* a knife can do; for the quick, clean cut and the blade to plough hard wood or soft, with the grain or against it, you won't find the equal of

## KEEN KUTTER

pocket knives, made from live English cutlery steel and with handles riveted to last. Your pocket couldn't hold better, and all Keen Kutter pocket knives are guaranteed to suit you or the dealer is authorized to hand you back your money.

Send for our Cutlery Booklet No. M551.



Pocket Knife  
No. K2613  
2 Blades  
Price  
\$0.85

If not  
at your  
dealer's,  
write us.

Simmons  
Hardware  
Company

St. Louis New York  
Philadelphia Toledo Minneapolis  
Sioux City Wichita

## One of the SIGHTS

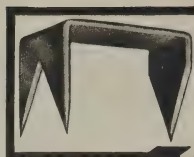
### of the great Northwest

**M**INNEAPOLIS has a new show place — another point of interest added to her many attractions. It is nothing less than a unique exhibit of every sort of building material.

We invite you cordially to attend this great permanent exhibit. Competent guides will be glad to show you the interesting displays.

**Northwest Building Material Exhibit**  
Entire Fourth Floor, First Nat'l-Soo Line Bldg.  
Minneapolis - - Minnesota

## Staples Like This Insure Honest Column Construction

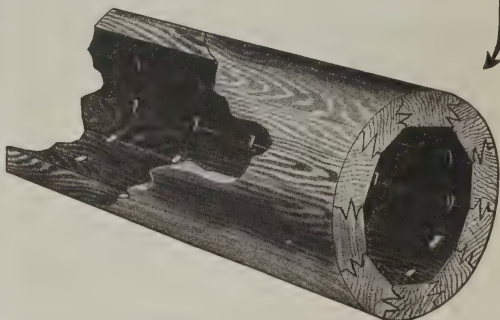


The sectional view of "STEEL SEWED" Columns below shows the double V joint which makes the column moisture proof. And it also shows how the staves are locked by **cold rolled steel staples** driven in every few inches, **after** the staves have been glued together under hydraulic pressure.

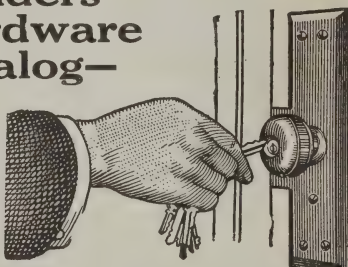
This **exclusive** construction means that "STEEL SEWED" Columns will outlast any building in any climate. Full description in catalog—a beautifully designed book that every builder should have. Free upon request. **We pay freight** on all columns.

AMERICAN COLUMN COMPANY

120 South Avenue - Battle Creek, Mich.



## Write For Our New Builders' Hardware Catalog—



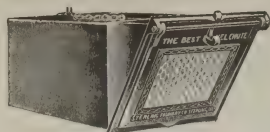
The line of Builders' Hardware shown in our new catalog is the most complete we have ever carried. And Corbin Locks lead. You'll see Corbin Hardware on all the better class of houses as well as office buildings. Our new catalog fully describes all the new designs in the Corbin Line and shows how we can save you money on your Building Hardware. Write today for this catalog.

**Gregg**  
HARDWARE CO.  
44-46 Cadillac Square

Detroit,  
Mich.







## The "BEST" Fuel Chute

The "BEST" Coal Chute is also a window, and can be made into a ventilator if desired. A heavy screen protects the glass when chute is open. Chute cannot be opened from outside. Also made with Solid Cast Door. Three sizes. Easily installed in new and old buildings.

### THE BEST LINE

Ask for our new catalog showing our complete line of Builders' Hardware. It includes Coal Chutes, Chimney Caps, Tops and Copings, Cleanout Doors, Cistern Covers, Stud Sockets, Foot Scrapers, Cesspools, Hog Waterers. Give us your dealer's name. Ask for descriptive circulars.

Sterling Foundry Co., 800 Wallace St., Sterling, Illinois



## FULL LINE of PLUMBING and HEATING SUPPLIES

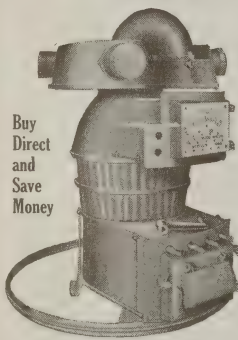
Sold Direct at  
Wholesale Prices

20% to 40%  
Saving

Complete bathroom  
outfits, tubs, closets,  
lavatories, kitchen

sinks, etc. Prompt shipment from a complete stock. The only house selling up-to-date, guaranteed goods at wholesale direct. Write for illustrated catalogue and prices.

B. Y. Karol, 800-802 So. Kedzie Ave., Chicago, Ill.

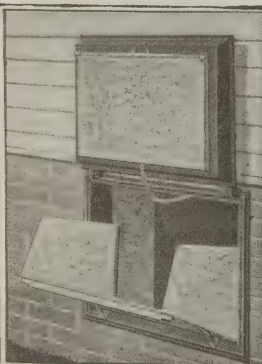


## GIBSON FURNACES

Burn smoke and gases—cut down ordinary fuel costs one half; the special construction of the combustion chamber is the reason why.

Install Gibson Furnaces in your customers' homes—satisfaction for them, profit for yourself. We sell direct to contractors. Get literature, prices and trade discounts by writing us today.

Gibson Mfg. Co.,  
415 Miles St., Waterloo, Ia.



## "JULIEN" Coal Chute

A perfect coal chute and an attractive looking basement window. Lets light in; keeps burglars out. Locks automatically from the outside; opens only from the inside. When in use the door protects the building, and a steel shield protects the glass. Write for circular, prices and discounts.

Loetscher-Ryan Mfg. Co.  
Main St., Dubuque, Iowa

work. Mr. Smith has such confidence in his machines and in our readers' integrity that we understand that he allows our readers to dictate the very terms on which they wish to pay for these machines. It will pay everyone who wishes a modern typewriter to ask Mr. Smith more about the machines which he has on hand.

## Dietzgen Measuring Tapes

The one thing which distinguishes a first-class mechanic from a laborer is in the accuracy with which he can do his work. It is absolutely essential that all measurements should be exact as otherwise the chief value of the work is lost.

The Eugene Dietzgen Co., 166 W. Monroe, in their catalog N, describe in detail their measuring tapes, which possess unusual advantages for the contractor and builder. The tapes are made in every conceivable length and style but the features which particularly will appeal to our readers are the black finish in which the figures stand out particularly plainly and in the simplified reading by which it is practically impossible to make an error in reading the measurement. Catalog N describes very thoroughly articles of use to the contractor and will be sent to our readers on request.

## Crescent Facts

Every contractor wants to lay off as many men as he can and still crowd his work to the limit. The use of suitable machinery will enable the contractor to cut down his working force while greatly increasing their efficiency. When the contractor has any wood working to do, the use of one of many machines from the Crescent Line made by the Crescent Machine Co., 10 Main St., Leetonia, Ohio, will save him both in labor and in the time of operation. The latest Crescent catalog contains 144 pages giving complete information about all their various machines.

## Stained Shingles

There are several reasons for staining the shingles that are used on the sides and roof of the better class of residences. It adds greatly to the color as any color scheme can be carefully worked out. If



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LETTERS YOU WRITE  
ADVERTISERS. IT HELPS

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## Hudson Asphalt Shingles Red or Green

—make durable, attractive and economical roofs for all kinds of buildings where shingles can be used. Positively will not crack or break, resist fire, require no painting. Colors are non-fading. Write today for samples and literature.

**Asphalt Ready Roofing Company**  
9 Church Street - - New York, N. Y.

**"GUARANTEED"**  
GRADE "A" PLUMBING &  
HEATING SUPPLIES.

**DIRECT TO YOU AT**

**WHOLESALE PRICES**

*Everything in GUARANTEED PLUMBING and HEATING SUPPLIES at WHOLESALE*

Bathroom Outfits, Sinks, Pipe, Fittings, Valves, Faucets, Heating Boilers, Radiators, Water Pressure Systems and Lighting Plants for Country Homes, etc. Our \$200,000.00 plant behind our GUARANTEE. Send for complete Catalog No. 31.

**JONH HARDIN CO.**

35 Years at 47th and Cottage Grove Ave. Chicago, Illinois

**\$185** **BUYS A MIXER WITH A \$2000.00 ACTION**

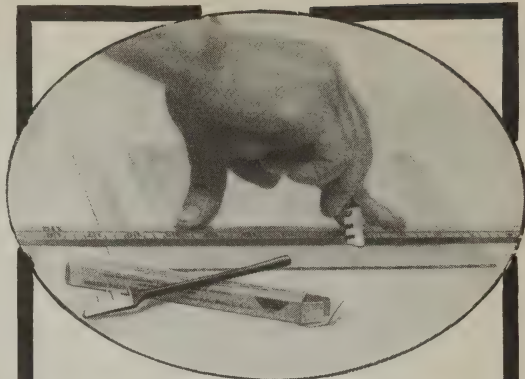
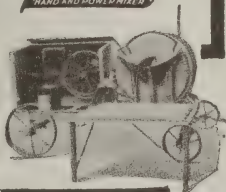
Packard Mixers have the same mixing action as the big \$2,000.00 pavers—they turn a batch 60 times in 60 seconds.

Five-foot capacity. Steel construction—semi steel gears. Mounted on steel trucks. Steel engine housing. Driven by a dependable 3 H.P. engine.

Furnished with Hoist, Power Loader, Batch Hopper and Measuring Water Tank if desired. Sold on trial. Cash or easy payments. Write today for catalog.

**Contractor's Machinery Co.**  
120 11th Street Keokuk, Iowa

**Packard**  
QUALITY  
HAND AND POWER MIXER



## Cut Clean and True

No faulty cutting—no poor breaks, but a clean, true cut that insures a perfect, even break. That is certain if you use

## MILLERS FALLS GLASS CUTTERS

Fitted with Millers Falls "Perfect Cutting" wheels, of just the right hardness and the right edge for clean cutting and long service. Require light pressure. Scientifically tested, two tests to each wheel. Each cutter packed in separate pasteboard box.

Millers Falls Glass Cutters are made in eleven different styles. No. 7—illustrated above—has iron handle, polished cutter head, single Millers Falls "Perfect Cutting" wheel—a high-grade cutter at an exceptionally low price.

Ask your dealer also to show you the other styles of Millers Falls Glass Cutters, notably No. 300, which has hardwood handle, stained and enameled; nickled head with six removable Millers Falls "Perfect Cutting" wheels. Write for Glass Cutter folder today.

Ask to see these other new Millers Falls tools at your dealer's: Millers Falls Bit Brace 872, Hand Drill 1980, Extension Bit Holder and the Acme Mitre Box.

**MILLERS FALLS  
TOOLS**



## Millers Falls Co.

Millers Falls, Mass.

and 28 Warren St., New York City

While at the Panama-Pacific Exposition don't fail to visit the Millers Falls Exhibit in Block 26, Avenue D, Manufacturers' Building.

**ROOFING SLATE**  
OF QUALITY  
MINERS MANUFACTURERS

**The AULD & CONGER Co.**  
DEPT. D

ESTABLISHED 1870  
CLEVELAND OHIO

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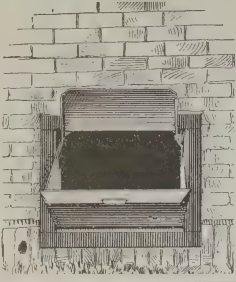
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## Kewanee All-Steel Coal Chutes

### Pay Profits



You, Mr. Contractor, can get this PROFIT, by installing Kewanee Chutes in your buildings.

Built entirely of steel—no cast iron nor glass to break or get out of order.

Automatic in action and easily installed in any building old or new.

Write for Special Proposition to Contractors

Kewanee Manufacturing Co.  
Kewanee - Illinois

## Thurman Vacuum Cleaners

*Stationary and Portable*

**For Residences, Hotels, Office Buildings, Etc.**

**70 Different Types and Sizes**

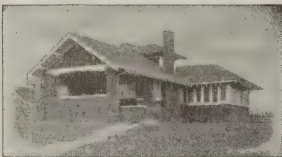
Residential (built in the house) Stationary Plants from \$150.00 up. Our Engineering Department is at your disposal to lay out your pipe line gratis. *Write for free booklet.*



**Thurman Vacuum Cleaner Company**

(Originators Vacuum Cleaning Machinery)

Dept. F. Eleventh & Monroe Sts., St. Louis, Mo.



### Miller's Bungalow Plans

are used exclusively in our book, "Bungalows and Other Things," which contains photographs and floor plans of many artistic homes that can be built for \$1,500.00 up. Get this book, it is the best of its kind on the market. Pick out the house you want and we will furnish the plans and specifications for \$5.00 to \$15.00. The book is receiving high praise from contractors and builders.

**Price \$1.00**

Burd F. Miller Co.

25 Brandeis, Omaha, Nebr.

## The Enterprise Coal and Fuel Shute

### The Easiest Installed

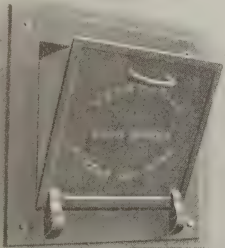
Non-Breakable—and Cheapest and Simplest Fuel Shute made. Cheapest because simplest.

Only four pieces—Frame, Spout, Lock and Weight.

Roller bearing hinges; no exposed bolts to tamper with. Positively no way to open it from the outside. All of cast iron—practically rustless.

Sent to any address on receipt of \$7.50. Write for Builders' and Dealers' Discount

Enterprise Iron Works  
Albert Lea, Minnesota

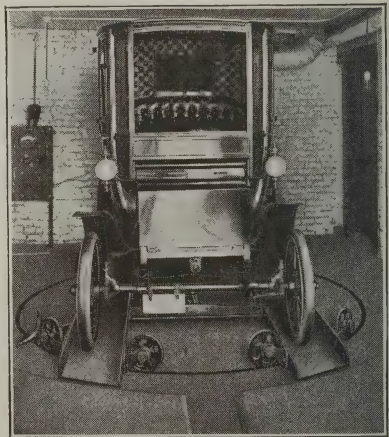


suitable stains are used the life of the shingle is very much longer. The Transfer Stained Shingle Co., 158 Main St., North Tonawanda, New York, specialize in stained shingles. Their "Weatherbest" Stain is a combination of wood preserving elements with mineral and chemical colors with which they saturate the entire shingle. The advantage of this process over the ordinary process of dipping only the butt or of brushing only the top surface of the finished roof will readily be apparent to every one. A great variety of colors can be obtained in these shingles and as they come to the contractor ready for use there is no delay in getting them in place and no painters mussing around with tubs of various colored stains.

The Transfer Stained Shingle Co. have prepared samples of shingles showing the various woods stained with a great variety of colors. These samples will assist the contractor in advising the owner as to the very best color combinations to use on his buildings.

### The Pitless Automobile Turntable

Every contractor who has an automobile or auto-truck realizes the difficulty in turning around in a very limited space. On the street he has plenty of room to do this but when he drives into his garage he finds a



A Turntable in the Garage

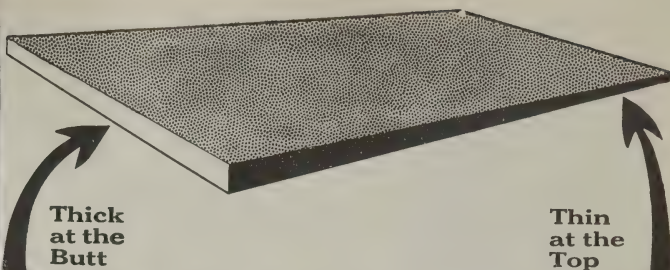
space too small to turn in and consequently must back his machine sometimes for a considerable distance. This is annoying and is also unnecessary as it is possible to obtain a turntable which will do this work



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**Don't Lay  
Another  
Roof  
Until We  
Send You a**



## **Winthrop Tapered Asphalt Shingle**

Just ask for a *sample shingle*. See how tough, how pliable and how durable it is. See how it is made like a wooden shingle—thick at the butt and thin at the top. See how easy to lay it is. See what a beautiful roof it will make—red, green or slate-black. Then you will understand why owners want the Winthrop when they know about it.

The Winthrop Tapered Asphalt Shingle will enable you to get most of the roofs in your town.

Drop us a card today for a free shingle.

### **The Beckman-Dawson Company**

ASPHALT SHINGLES

Factory: Argo, Ill.

1415 Association Bldg., Chicago, Ill.

Many of the classy new buildings this spring are being roofed with Winthrop Tapered Asphalt Shingles. With their beautiful red or green colors they attract attention and get more business. Over 1,000 Winthrop Roofs in one town.

One of the Many Winthrop  
Tapered Shingle Roofs



Advertisers' Section.

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## If You Want Convincing Proof That Hotchkiss Lock Metal Forms



### for Sidewalks and Curbs

are a profitable investment, write for our free demonstration proposition.

You can get into the concrete curb building business in your city and make good profits; you can lay your own sidewalks economically.

Let us tell you about these forms and others—look into this now!

**HOTCHKISS LOCK METAL FORM CO**  
19 Jarvis Street - Binghamton, N. Y.



## Cushman Light Weight Engines

Are easy to move around, yet are reliable, quiet and easy running. This shows an 8 H. P. 2-Cylinder Cushman connected to a hoist. Engine weighs only 320 lbs. A handy outfit for Contractors and Builders, requiring little space for operation. Any size outfit desired can be supplied. Write for full information, specifications and price.

**Cushman Motor Works, 915 No. 21st St., Lincoln, Neb.**

## RELIABLE ERIE

### The Hoist You Want

You want the "Reliable" because you want reduced hoisting costs; naturally! The efficiency of the "Reliable" is above the normal; its cost is below. Capacities from 500 to 2000 lbs., and each size will take care of a big overload without risk of breakage. Simple—sturdy—ample reserve strength. Learn what real hoist service means by writing for the "Reliable" catalog.

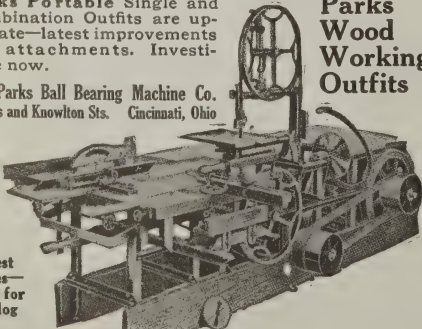
**Erie Clutch & Pulley Co., 24th and Holland Streets, Erie, Penna.**

**Parks Portable Single and Combination Outfits are up-to-date—latest improvements and attachments. Investigate now.**

**The Parks Ball Bearing Machine Co.**  
Fergus and Knowlton Sts. Cincinnati, Ohio

**Parks Wood Working Outfits**

Lowest  
Prices—  
Send for  
Catalog



and which can be installed in any garage or in any required space. The cut with this article shows such a turntable made by the Pitless Auto Turntable Co., 2420 Broadway, Kansas City, Mo., and indicates the ease with which a car can be turned so that one can work around it or drive out of the garage without backing.

## The Hold-Fast Bevel

Nothing is much more exasperating than to carefully set a bevel and then have it slip after you have carefully carried it down a ladder or possibly some distance about the building. It simply means going right back and doing the whole job over again.

The Hold Fast Bevel made by the Southington Hdw. Co., Southington, Conn., have



The Hold Fast Bevel

designed a bevel which they claim will not slip through any ordinary usage. A cut of this bevel appears above and will give the carpenter an excellent idea of its value. The bevel is described in detail in the general catalog of the Southington Hardware Co., which also shows the Standard Take Down Square, which is also of great interest to our readers, especially those who are obliged to make frequent trips with their tool box on their shoulder.

## Ventilators for Every Purpose

Those of our readers who are specializing on dairy barns and farm buildings should pay particular attention to the matter of ventilation. Fresh air and plenty of it is the rule for all farm buildings, but one must be careful that the current of air goes in the right direction and that the ventilator



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## House Moving Pays Big

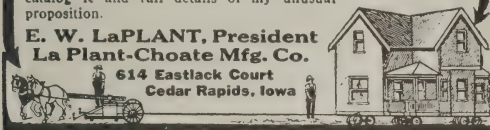
In every town and city throughout the United States there is a remarkable opportunity for a good, live, wide-awake man to engage in the house moving business. I don't care if there are one or more house movers in your town now I can show you how to

**Clear \$100 to \$300 On a Job**

With the plan I have to offer you, you can get the business in spite of any and all competition; besides, I can show you how to develop your business in a profitable, money-making way that other house movers don't think of. Write me today Ask for catalog R and full details of my unusual proposition.

**E. W. LaPLANT, President  
La Plant-Choate Mfg. Co.**

614 Eastlack Court  
Cedar Rapids, Iowa



## Wheeler Safety Scaffold Brackets

In Position

Fold Compactly

**Save Lumber-Save Labor-Save Nails-Save Accidents**

Pay for themselves on two jobs. Last a lifetime. Lock automatically. Are rigid and firm when in place. Scaffold cannot swing. Men cannot be careless putting them up. Write for our **Free Trial Offer**. American Steel Scaffold Co., Dept. 4, Detroit, Michigan

## STILLWELL CALIFORNIA BUNGALOW HOMES

—have the latest built in effects and are the result

of years of specialization. They are truly Californian, yet meet the requirements of any climate. Our books contain our most successful plans—a variety from which even "the hardest to please" will be able to select satisfactorily.

### 132 PRACTICAL BUILDING PLANS

"Representative California Homes"

50 ideal homes, \$1600 to \$6000—Price 50c

"West Coast Bungalows"

51 inexpensive homes, \$600 to \$2000—Price 50c

"Little Bungalows"

31 perfect little homes, \$300 to \$1700—Price 25c

We sell books and blue prints on a money back guarantee.

**E. W. Stillwell & Co., Architects, 4386 Henne Bldg., Los Angeles**

**SPECIAL!**  
All 3 Books \$1 Paid  
sent for....

## WAGNER STUDDING SOCKETS

### FOR CEMENT FLOORS

—easiest, quickest, best way to anchor studding to cement floors. Takes but a minute or two to set the sockets in fresh cement, and once the cement is set, the sockets hold forever.

Protect bottoms of studding against decay and insure long life to the building. Used for garages, barns, and all frame buildings with cement floors.

### Your Dealer Can Supply You

We will fill your order direct if your dealer doesn't sell Wagner Sockets. Write for circular.

**WAGNER MFG. CO.**  
Dept. E., Cedar Falls, Iowa



Advertisers' Section



## Be An Agent for a Rule Every Carpenter and Builder Needs

Improved Interlocking Fool-proof **Master Slide Rule** gives inside as well as outside measurements of doors, windows and everything else instantly and accurately. Strongly made, rust-proof and designed to last many years.

Price 15c per foot, in sizes from 4 to 8 foot lengths. Order a trial rule.

Anyhow learn about our agency proposition. Circular B tells.

**DAHL MANUFACTURING CO.**

51B East 42nd Street New York City

## THE ROCK OF AGES CLEFT FOR YOU

RED GREEN  
PURPLE BLACK  
**SHELDON'S SLATE**

## THE ROOF FOR AGES ALWAYS NEW

Artificial substitutes bring endless expense for upkeep. Post a postal and get posted.

**F. C. Sheldon Slate Co., Granville, N. Y.**

## Here's YOUR Chance



If you've never had the advantage of a first-class knowledge of Building Plans, Specifications, Estimating, Contracting, etc., then here's your opportunity.

Our Chicago school has hundreds of carpenters and builders who are studying Plan Reading, Estimating, Contracting, etc., in the Day and Evening Classes. You can study the same work at home by our new, quick, easy method. We've no books to sell. We do have practical work, offered by no other correspondence course in America.

## Chicago Technical College

**Study at Home by Our New, Quick, Easy Plan Builders' Course in Plan Reading, Estimating, etc.**

Don't study from old-time plates in books. Use "Chicago Tech." up-to-date blue print plans of buildings now being built or recently completed. Let us tell you more about our plan of helping you go after the big job. Write today. Never mind the cost—it's small, anyway. We want the earnest, ambitious men in the building trades.

**Mark and  
Mail the  
Coupon  
NOW!**

**\$15**

**Outfit and  
all Blue  
Prints**

**Free**

Chicago Technical College, 1018 Lake View Building, Chicago  
Gentlemen: I have marked with a cross (X) the branch or branches interesting me.

☐ Architect. Draft'g ☐ Bldg. Superintendence  
☐ Builders' Course ☐ Structural Drafting  
☐ Estimating ☐ Structural Design  
☐ Plan Reading ☐ Mechanical Drawing  
☐ House Planning ☐ Machine Drafting  
☐ General Contracting ☐ Machine Design

Name .....

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Town..... State.....

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Chicago Technical College, 1018 Lake View Building, Chicago

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**Cordage  
Tackle Blocks  
Contractors'  
Supplies**

**Tents                      Waterproof Covers**

*Quick Service — Bottom Prices*

**GEO. B. CARPENTER & CO.**  
202-208 Austin Avenue    Chicago, Illinois

**Introducing the New Sasgen 1 Ton  
Portable Stiff Legged Derrick**

**Built Strong and Light of all Crucible Steel  
Fittings**

Peerless Steel  
Derrick  
1800 lbs.  
Capacity

Write for  
circular  
"N"



Prices very low  
and arranged  
according to length  
of boom.  
Satisfaction and  
prompt shipment  
guaranteed.

**Sasgen Derrick Co., 2053-57 N. Racine Ave., Chicago**  
Canada Office: 1 Wabash Ave., Toronto

**Galvanized Iron  
Cut Nails**



For shingles, slating, boat and wharf  
building, fencing, sheathing and all  
exterior work use

**Anchor Brand Iron Cut Galvanized Nails**  
as they will outlast the best of wood under all  
climatic and weather conditions.

**Write for Prices**

**E. & G. Brooke Iron Co., Birdsboro, Pa.**

**Galloway "Six"**  
—the 4-in-1 engine—

Use it for driving your Saw Rig—your Pump—  
your Concrete Mixer—your Hoist. Plenty of weight, plenty of  
strength, plenty of power. A real masterpiece—in name and operation.



Backed by the Gal-  
loway reputation; guaran-  
teed by the Galloway policy.  
Costs you only **\$98.75**  
because we sell direct from  
factory to user. Order today  
—or send for catalog.

**The Wm. Galloway Co.,  
2515 Galloway Station  
Waterloo - - Iowa**

draws out the vitiated air and permits the fresh air to enter.

Barn ventilation has been given special attention by the Globe Ventilator Co., 203½ River St., Troy, N. Y., and a number of styles have been designed for various purposes. Their latest style consists of a weathervane being fixed to the top of the ventilator, thus adding considerably to its value on the farm.

The Globe Ventilator Co. has interesting literature regarding their ventilators, where they have been used, the satisfaction which they have given and the extremely moderate prices at which they can be furnished.

### Plenty of White Pine

The Northwest Supplies Co., 919 Washington Ave., S. E., Minneapolis, Minn., have an exceedingly interesting pocket size catalog of lumber, millwork and other supplies for the contractor. The catalog has been made up along new lines in such a way that it gives the contractor a great deal of information which he could not heretofore obtain. For instance, the tables on lumber give not only the amount of feet in each piece from 2x4x8 to 8x8x30 but it gives the price per piece, the price per M, and the weight of each piece. The Northwest Supplies Co. have their warehouses well stocked with building papers, roofing, wall board, doors, windows, and all kinds of both interior and exterior millwork, trim, etc. Their yards contain not only fir and cedar but a large amount of white pine in practically all the commercial sizes. The contractor will, therefore, be able to get all of his material at one time instead of being delayed while the various materials are being assembled from two or more points.

### Talking Versus Walking

The Inter-Phone, as described in catalog 25 B L of the Western Electric Co., New York, is a convenience of which every one of our readers should be familiar. In general the Inter-Phone is a trade name adapted by the Western Electric Co. for what is generally known as an intercommunicating telephone. In other words, the Inter-Phone is a private telephone between any two rooms or buildings, possessing all of the good features of the public phone but without requiring the services of an operator or central station.

Advertisers' Section



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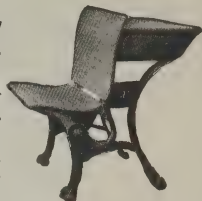
## Install Steel Seating and Make BIG Profits— WE HELP YOU



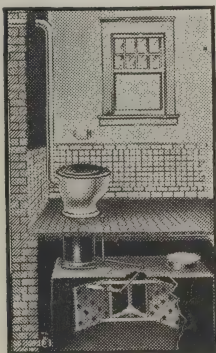
We want Contractor-Agents in every locality to install our *Steel Seating* in Schools, Theatres, Churches, Lodge Halls, Moving Picture Houses, etc. Write us *now* if you can handle the work.

*Steel Seating* is more sanitary and lasting than wood, stronger than cast iron. Light in weight, handsome in appearance and economical in cost.

We will gladly furnish free seating plans for any job contemplated, and co-operate with our agents to help them get contracts at *good profits*. Investigate our proposition by writing today.



**Steel Furniture Company, 1483 Buchanan Ave., Grand Rapids, Mich.**



## For Health

convenience, comfort and economy, there is no closet made which compares with the Wolverine Sanitary Chemical Closet. Chemicals eighteen times stronger than carbolic acid kill all the odors and absolutely prevent development of disease germs. Complete outfit, installed, for one-fourth the cost of a water system. No more running out in the cold and wet—no more doctor bills. Order a Wolverine Indoor Closet and have the convenience of a city home.

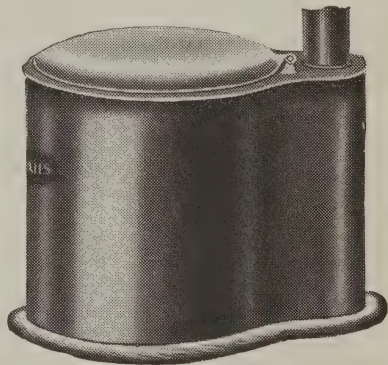
### A Money-Maker for Agents

This closet sells easily and sells fast. Every rural home now having outside closets should have a Wolverine Sanitary. 200,000 prospects in one state alone. Liberal commission paid. Men now making big incomes. Selling literature furnished *free*. Write us today for agency in your county.

### No Water or Sewer Necessary

Wolverine Sanitary Indoor Closet needs no septic tank, no water system or expensive plumbing. Costs 1c a day to maintain. Simple, trouble-proof, odorless, and absolutely guaranteed.

**DAIL STEEL PRODUCTS CO.**  
**835 East Main St., Lansing, Mich.**

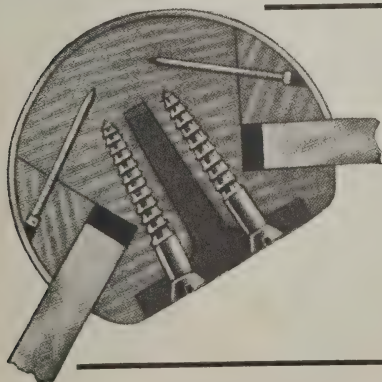


## Why Not Be the Store Front Man in Your City, Town or Village?

We will help you. We get the orders—you look after the construction work.

This is congenial, profitable work, and a little team work between us will bring more business, more money. Write for our proposition. It's a good one for you.

**J. W. COULSON & CO.**  
**95 West Spring Street Columbus, Ohio**




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**\$15, \$25 and \$35**

Scrape your floors with Fox Machines. Scrapes any floor with even, uniform cut.

Six to 19 knives with each machine. Theright scraper at the right price.

Write for catalogue.

**Fox Supply Co.**  
Dept. N  
Brooklyn, Wis.

Sent on 10 Days' Free Trial

**The AUTOMATIC BALLBEARING ELECTRIC Floor Surfacing Machine**



will save you money by rapidly finishing your new or old floors just the way you want them. Self-propelling—you simply guide.

Write today for booklet telling all about the machine, our free trial offer and list of users near you.

Patented Oct. 15, 1912.  
Made in several sizes.

**WAYVELL CHAPPELL & COMPANY**  
Phone Ravenswood 4143  
Dept. C, 4845 E. Ravenswood Ave., Chicago, Illinois

**FREE TRIAL Rapid Floor Surfer**



**Made in Several Sizes**

**M.L. Schlueter**  
225 W. Illinois St.  
CHICAGO

**The WEBER Double Acting Floor Scraper**

**Try It For 5 Days at Our Expense**



Scrapes 800 sq. ft. of floor per day easily—1200 feet if you "speed'er up." Saves \$5 to \$8 a day over hand labor. Operates easily and cleanly. Prices \$15 and up.

Our agency proposition means easy money for you; write us about it.

**WEBER MFG. COMPANY**  
661 71st Ave., West Allis, Wis.

The Inter-Phone is especially valuable in high grade residences for communication between the different rooms or between the house and garage or separate buildings upon the estate.

The Western Electric Co. are prepared to assist contractors in determining just what style of instrument and what equipment is most suitable for any particular installation. Dept. 25 BL is especially prepared to take care of problems of this character for our readers.

### Business Publications Plan Chicago Exhibit

One feature of the coming convention of the Associated Advertising Clubs of the World which is arousing considerable interest is the educational exhibit of the Trade and Technical Publications. At Toronto last year this exhibit attracted a great deal of attention. As the visiting advertising men studied the many charts and diagrams showing the possibilities of business publications as advertising mediums, they awoke to a new appreciation of their value. Those who will see the exhibit which is now being prepared for the Chicago convention will be equally impressed.

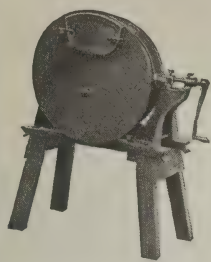
One point this exhibit will emphasize will be the tendency of modern business publications to select circulation of utmost value to the advertiser. A few years ago publishers were not particular as to the buying power of a subscriber but today they recognize that circulation of a non-buying variety is a liability. Most business publications cost many times the subscription price to produce, hence the increasing tendency to spare no effort in securing all the buying units in the field. It is this far-sighted circulation policy which has done so much to put business publications in the first rank of advertising mediums.

In addition to the exhibit of business papers, there will be similar displays by the specialty manufacturers, magazines, newspapers and so on down the line. But the lodestone of the convention will undoubtedly prove to be the departmental sessions which will be held in the Auditorium Hotel and Annex. A very comprehensive program is planned and many prominent business men will speak and it is expected that over ten thousand will attend the convention which will open on June 20, lasting until the 24th.

Advertisers' Section



PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS



# \$28.00

Buys this hand

## Concrete Mixer

**ONLY \$28.00** for a Giesler Hand Concrete Mixer—a machine that will stay on the job and work right always! Six turns of the drum produce a perfect mix. Easy work—a boy can operate it. (Pulleys to operate with gasoline engine, furnished at small extra charge.) Built strong and substantial to give years of service—yet weighs less than 200 pounds. Just the machine you need—and you can get it now at the low price of \$28.00.

**Write for Catalog Today**  
**Agents, Write for Proposition**

**Galland-Henning Mfg. Co.**  
1102 Railway Exch. Bldg., Milwaukee, Wis.

## A distinctive finish on any building is a good advertisement for the builder

The first impressions are the most lasting and effective.

The finish of the woodwork is the first noticed feature of any interior. The quality of the finish is more important than that of the wood itself.

Good wood and good workmanship will be enhanced if the right finish is used. Using inferior finishes is poor economy when your reputation is at stake.

## STICKLEY

### Stains and Finishes

represent the difference between mediocre and *good* for interior decorating. They are the identical products that have helped in making Stickley Furniture distinctive.

Their cost is moderate. And if you wish to use a stain that only you in your locality can furnish, we will prepare special stains for your individual use, if a sufficient quantity is ordered.

Our Mission Wax is the same as we have used on Stickley Furniture for six years. It covers 25% more surface than ordinary beeswax, being in semi-liquid form, and produces a waterproof finish.

Write us for complete information; we will gladly co-operate with you upon any special work you have in contemplation.

**STICKLEY BROS. CO.**  
Grand Rapids - Michigan

## Name it before June 10th

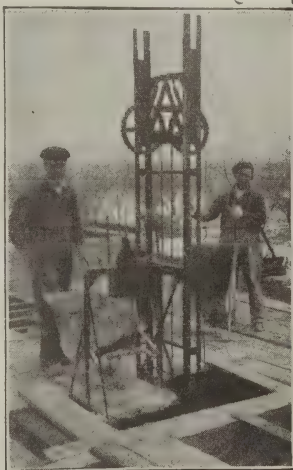
How would you like to see your name in our July ad as the winner of our new Builders' Hoist? We want a suitable name. Whoever sends in the best name gets a hoist absolutely free. This is your opportunity. All answers must be mailed on or before June 10th.

### Saves Building Expense

Our Builders' Hoist saves in building costs; elevates any material; does away with labor, hod and barrow expense; save nearly **one-third** of your brick-laying costs.

Send for pictures and description of this Hoist. Mail us a name before June 10th. Get busy now and win a Free Hoist.

**Attractive Territorial Proposition for Representative Supply Houses**



**H. B. Sackett Screen & Chute Co.**  
1689 Elston Ave., Chicago  
Eastern Office:  
199 Medford Street, Charlestown, Mass.

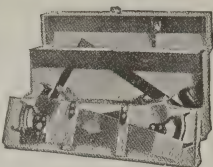




## INDESTRUCTIBLE Carpenters' Tool Cases

Stronger than any wooden chest, much lighter, holds tools better, much easier to carry. Same shape as a suitcase when folded and carried like one.

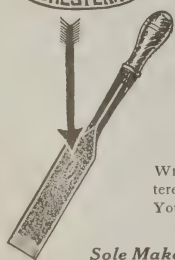
Made of 3-ply veneer, covered with heavy canvas and painted. Edges and corners are bound and reinforced with steel. Two brass catches and locks. Contains a place for every tool. Two sizes—31 in. for 26 in. saws, 33 in. for 28 in. saws. Will last a lifetime. Write for booklet and prices now.



**WEDELL & BOERS**

157 Jefferson Avenue, DETROIT, MICH.

D.R. BARTON  
1892  
ROCHESTER, N.Y.



## What the Sterling Mark is to Silver—

the BARTON trade mark is to Carpenters' Tools—the highest in quality and the highest in price.

Write for book "True Stories" and an interesting article on how our tools are made. You'll know then why our tools cost more.

**Mack & Company**

Sole Makers Brown's Race, Rochester, N.Y.

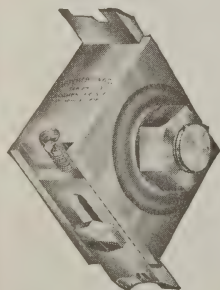
## Don't Pay More Than \$17 for a Dumbwaiter

The "Highwood" Dumbwaiter costs only \$17.00, (f.o.b. cars). It's ready for erection; you don't have to build the car and you don't have to build the machine; they are ready to erect and can be easily erected by any builder. Price includes 24-inch square car, machine set on timbers, counterweight, ropes, nails, etc. Modern, practical design; thorough construction; easy operating. Satisfaction guaranteed or money refunded; write for catalog.

**HIGHWOOD DUMBWAITER CO.**  
134 Highwood Ave., Leonia, N.J.



## CUTTER HEAD



Designed to meet the needs of the carpenter and builder who wants to make his saw table do more work. Any shape knives made to order. Runs like a solid cutter.

Catalog No. 34 sent on request

**Huthier Bros. Saw Mfg. Co.**  
1105 University Ave., Rochester, N.Y.

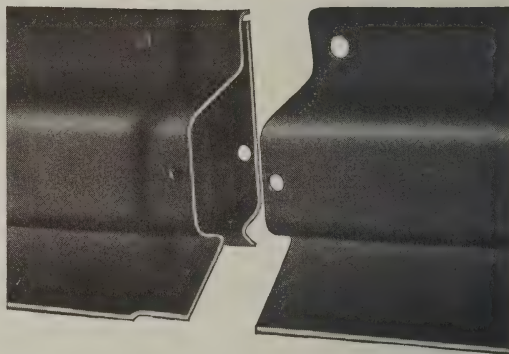
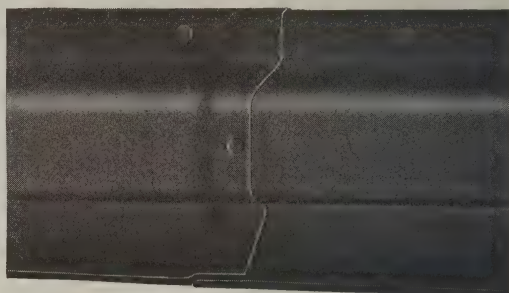
Patented December 30, 1913



PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS

## The Ever Tight Trolley Track

What contractor has not been obliged to hear complaints about trolley tracks getting filled up with snow, ice or birds' nests? What contractor has not been obliged to fix at his own expense numbers of cases



The Wagner Barn Door Track

where the track got out of line or was damaged by some trivial accident? Those who have will appreciate the Wagner Ever Tight Trolley Track, made by the Wagner Mfg. Co., Dept. E, Cedar Falls, Ia. This track is designed to be trolley track perfection and is carried in stock by practically every first-class hardware store. We are advised by the Wagner Manufacturing Co. that those who cannot find it in their nearest stores can secure an illustrated circular from them direct.

## American Portable Woodworker

The average contractor is a busy man, and out of work he is busy looking for a contract and when he lands it he is busier still trying to make money on it. One of the contractor's busiest moments is when he is trying to finish the building without sufficient material; in other words, when

# Record-breaking *low* prices! Record-breaking *high* quality!

## Cornell-Wood-Board

with the *Original* Cornell Fibre Sizing Process--the treatment which has revolutionized the Wall Board business

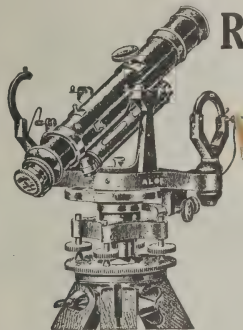
# 5

## Big Reasons why it's best—yet costs less

1. **Raw Material**—Our timber lands, located adjacent to the plant insure a **permanent** and **economical** supply of highest quality raw material.
2. **Power**—The 20,000 H. P. water power development, a part of our plant, provides ample power at minimum cost.
3. **Facilities**—The only mill in the world combining all processes of wall board manufacture under one roof and one management. Factory-built, **not assembled**, and therefore uniform.
4. **Capacity**—300,000 sq. ft. of Cornell Wood Board per day. Largest wall board factory in the world.
5. **Distribution**—Stocks in all principal cities insure prompt delivery at lowest cost.

**Cornell Wood Board, Cornell, Wisconsin**

**Write!** Contractors, Architects, Dealers! Valuable information awaits your requests. Send for literature, samples and prices.



## Rent This Level 10 Months, Then It's Yours

**Builders — Contractors** — This is not the old style Architect's Level. It is the newest 1915 model **convertible** level. There is not a single Builder or Contractor who has not almost daily need for this instrument. For laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning shafting, walls, piers, etc., for getting angles, locating levels anywhere, ditching, laying streets and walks, running straight lines, and a hundred other uses.

### Instruction Book Free

Complete illustrated booklet telling how a builder or contractor can use the convertible level sent free on request.

### Send Coupon—No Obligation

Send the attached coupon today and we'll send illustrated booklet and complete details of how you can own the Aloe Convertible Level for 10 months' rent.

**A. S. Aloe Co., 613 Olive St., St. Louis, Mo.**

### Warning

The Level we offer is the Aloe Convertible Level. Don't confuse the Convertible Level with the ordinary old style Architect's Level. The only work that can be satisfactorily done with the ordinary Architect's Level is the determining of elevations. But the Convertible Level, besides its use as a level, is a modified "Transit" and broadens the use of the level 100 per cent. You can't afford to buy any but the Aloe Convertible Level.

### Half Century Reputation

We have been manufacturers of transits and levels since 1863 and our instruments are the standard of the world.

### Free Trial

We allow you to convince yourself by a trial of the instrument before you obligate yourself.

### The Rent Buys It

No large cash outlay needed. Just pay the monthly rent for a few months and the instrument automatically becomes your property.

### COUPON

A. S. Aloe Co.  
613 Olive St., St. Louis, Mo.

Please send free instruction book on the use of the Convertible Level and complete details of your rental plan. This request in no way obligates me.

Name .....

Occupation .....

Street .....

City ..... State .....


National Builder, June, 1915

Advertisers' Section

PUT THIS DONE ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS





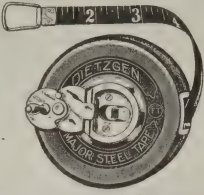


**⚡ This Reads: 19 ft., 11 in.**

You get the total measurement at *one glance* on **Dietzen Steel Measuring Tapes** — the simplified reading saves time—delays—mistakes.

Black finish ribbon, etched divisions and numbers; superior accuracy. Write today for Catalog N.

**Eugene Dietzen Co. Manufacturers**  
Measuring Tapes Drawing Materials  
Surveying Instruments  
Chicago New York San Francisco New Orleans Toronto Pittsburgh Philadelphia



## Stop Wasting Valuable Time



worrying along without an instrument or—worse yet—with one that is complicated, worn out or unreliable!

**Be up-to-date!** Safeguard your **reputation** and your **profits** by checking all lines and grades with a 1915 Model

**"Sterling" Convertible Level**

An examination of this splendid instrument will convince you that it is the most **practical, serviceable** and **efficient** level made!

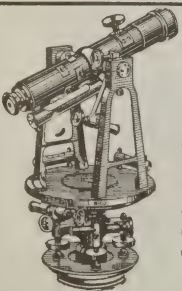
**Repairing a Specialty**  
Bargains in Second-Hand Instruments  
**WARREN-KNIGHT CO.**  
136 N. 12th St. Philadelphia

## Make Your Barn Work Pay a Bigger Profit



You, Mr. Contractor, are the logical man to install Strickler Barn Equipment. Take Mr. Farmer's order; we give you a big commission. Our line is complete and well-known. Includes steel stalls, stanchions, litter carriers, etc. Most modern and sanitary. Write for our offer.


**STRICKLER HAY TOOL CO.**  
Janesville - - Wisconsin



## Builder's Transit

For the builder or architect who wants to raise the standard of his work—who takes conspicuous pride in the accuracy of his efforts, this transit is especially designed. It is but one of the complete line of Beckmann quality instruments. Send for our complete free catalog.

**The L. Beckmann Co.**  
101 Adams St., Toledo, O.



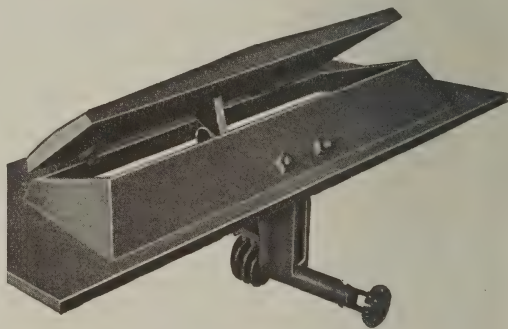
the planing mill or supply house falls down and leaves him without the very materials he is the most in need of.

The Portable Variety Woodworker made by the American Saw Mill Machinery, 81 Main St., Hackettstown, N. J., is designed for this busy contractor. It will enable him to get out the millwork of which he is in the greatest need and it will also do a great deal of cross and rip-sawing, as well as giving the contractor the use of a mitre saw, scroll saw, dado machine, grooving, rabbeting and tenoning machines, a joiner or planer, a borer, matcher or moulder, a sander or hollow chisel mortiser. All of these machines are ready to operate by pressing a button when the machine is equipped with an electric motor or by starting the gasoline engine should it be supplied with that kind of power.

The catalog of the American Saw Mill Machinery describes this woodworker in great detail as well as gives prices, weights, freight rates and various information of use to the contractor.

### Fireplace Equipment

Every one likes to see a fireplace and the only objection which has heretofore prevailed against them is their tendency to be wasteful of fuel while sparing of the heat furnished. The reason for this has largely been the fault of the damper which was not adjustable enough to provide for the



The Stover Damper

varying conditions during the process of combustion, when the fire first starts it must have a good draft in order to carry out the excess amount of smoke, but after the fire gets a good start the damper should be closed so as to provide only the draft required to keep the fire burning.

Advertisers' Section



PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS

# Accuracy in Long Measurements

When you are taking long measurements, don't stop to use a rule with its possibilities for error, or a cloth tape which may stretch, but get your distance quickly and exactly by using a

## Starrett Steel Tape

You can rely on your measurements when you use a Starrett, because Starrett tapes are carefully graduated and marked so as to prevent error in reading. The convenience of handling a Starrett and the time saved will be well worth the price of the tape.

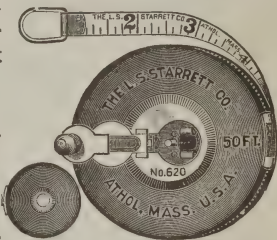
Starrett tapes are made in a wide variety of styles and lengths. There are little fellows 3 feet long for pocket use and big ones 100 feet long. Some are contained in leather

cases, some in nickeled steel cases, and some come on handy reels. The new patent push-button tape shown here is a great convenience in opening the handle.

Our free catalog No. 20M shows the styles, sizes and prices for each. You can buy Starrett Tools at all good hardware stores.

**The L. S. Starrett Co.**

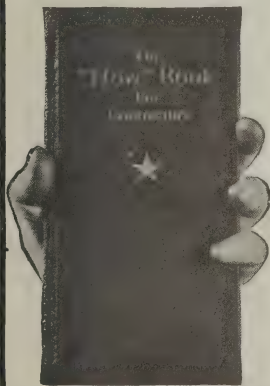
*World's Greatest Toolmakers*      *Athol, Mass.*



42-367



NEW YORK, U.S.A.



# How to Make More Money Building Barns!

## The "HOW" Book for Contractors and Details of Our Co-operation

Write us today—send us the names of folks in your section who are going to build new barns—remodel old ones or install concrete floors and we'll send you by return mail free of all cost our 126-page, Keratol Leather Bound, Pocket Size "How" Book for Carpenters and Contractors, (detailed description below) and full detail of how our Architectural Department co-operates and helps you make more money building barns.

We are the largest firm in America engaged in the manufacture of modern barn equipment and our thousands of dealers, innumerable satisfied barn owners, big and aggressive sales force, drafting department, in fact, our entire organization get back of you the minute you ask us to co-operate.

And our services are free to you—don't cost one penny but are worth big money.

Write for the "How" Book and details of our co-operation.

## Description of the "HOW" Book

126 pages. Pocket size. Bound in durable Keratol leather. Packed from cover to cover with information that saves the contractor time and money.

### Pocket Size Encyclopedia

It tells how to figure life, strength and quantities on all kinds of building material. Safe loads—bending stresses—crushing strength—timberweight—waste—shrinkage—roof pitches—labor costs in roofing, carpentry and masonry work, etc. Ready reckoner, too—all compiled from authoritative sources. A wealth of practical, usable every-day information that you as a carpenter and contractor can't afford to be without.

**HUNT, HELM, FERRIS & CO.**

**340 Hunt Street      -      Harvard, Illinois**

## Free "How Book" and Blue Print Offer

**HUNT, HELM, FERRIS & CO.,**  
**340 Hunt Street, Harvard, Illinois**

Send me free of all charges, 126-page, Keratol Leather Bound, Pocket Size "HOW BOOK" and details of your FREE BLUE PRINT SERVICE and co-operation. Enclosed find a list of folks in my vicinity who expect to build new barns, remodel old ones or put in concrete floors this spring.

Name.....

Post Office.....

R. F. D..... State.....





The Stover Mfg. Co., 35 E. Street, Freeport, Ill., have designed their fireplace damper as shown above so as to be instantly opened or closed as little or as much as is required by the condition of the fire. This enables one to have just the amount of draft desired and consequently have just the amount of heat which the occasion requires.

The catalog of the Stover Mfg. Co. shows a complete line of dampers, ash-pit doors, clean out doors, thresholds, andirons, fire baskets and screens, spark guards, gas logs, etc.

### Protection Against Fire

It is a recognized fact that a large number of fires occur from sources beyond the building in which the damage is done. More than 10 per cent of the fires which occurred in one of the southern cities last year were caused by sparks from adjoining

ly showered with sparks from the adjoining building, the roof of which, as will be seen in the illustration, was largely burned away. The house with the metal roof, however, sustained absolutely no damage.

The Edwards Mfg. Co., have an exceptionally complete catalog showing their products including photographs of the various materials in use and this catalog will be sent to those of our readers who request it.

### High Grade Mixers

When the contractor realizes that he must meet close competition figuring his estimates he will realize the value of labor saving machinery after he secures the contract. Unless he has carefully considered all of the problems he is apt to loose money on the job.

Concrete mixing requires a great deal of work, but it is work that can readily be ac-

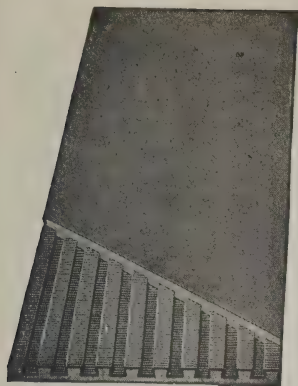


An Edwards Metal Tile Roof Unharmed by Fire from Adjoining Building

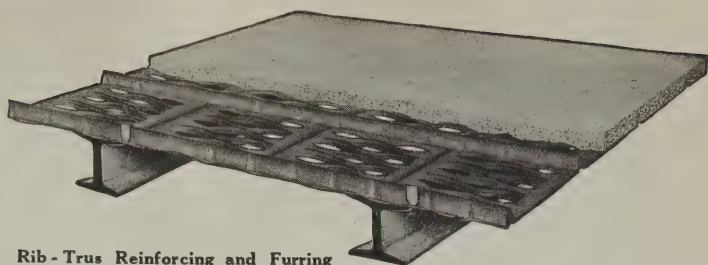
buildings. This would indicate that a fire-proof roof such as would be obtained by the use of metal shingles would be of great value in reducing the fire loss.

As an instance of how this works out in practice we are able to show through the courtesy of the Edwards Mfg. Co., 430-450 Eggleston Ave., Cincinnati, O., the photograph of a building protected with Edwards Metal Spanish Tile. This roof was recent-

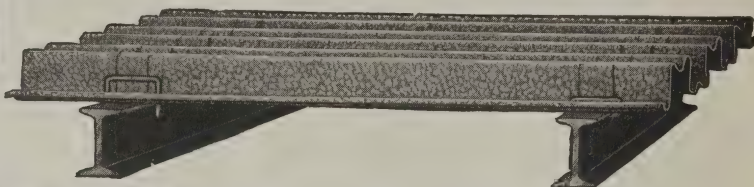
ly accomplished by a machine, thus saving the time and labor of men. The Eureka Concrete Mixer made by the Eureka Machine Co., 107 Handy St., Lansing, Mich., is designed to be of the utmost value to the contractor. Bulletin No. 56 issued by the above company describes a number of the styles of mixers made by this company as well as gives information as to their weights, prices, etc.



**Ferro-Lithic Reinforcing Plate**—Greatest sectional area of metal per gauge of any plate manufactured for Concrete Floors, Roofs and Sidewalls.



**Rib-Truss Reinforcing and Furring Plate**—For Roofs and all kinds of Light Concrete or Plaster Construction. No centering or false work needed on ordinary spans.



**Multiplex Steel Plate**—For constructing Heavy Service Floors with the least possible difficulty.

See our Section in Sweet's; pages 210, 220 to 224

Write for Special Catalog F. N.

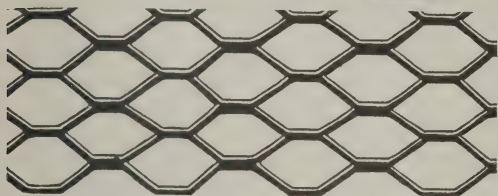
**The Berger Mfg. Co., Canton, Ohio**

Largest Sheet Metal Works in the World

Our Nearest Branch for Best Service:

New York      Boston      Chicago      Minneapolis  
Philadelphia      San Francisco      St. Louis

Export Department: 11th Ave. and 22nd St., New York City



**Expanded Metal Lath**—Steel or Toncan Metal (Anti-Corrosive.) All Gauges—Painted or Galvanized.

# Wood Fibre **Fibro-Walboard** Wood Fibre

Decorated ready to apply — Linseed Oil Coated both sides. Artistic two-tone effects. You save the cost of paint and labor, or \$15 to \$16 per thousand square feet.

*We Also Make*

## Artistic Oak Grain Board

*We are the pioneer makers of high-grade Wall Boards and have sold many million sq. ft. to satisfied customers. Our aim is quality first.*

*Write for Samples and Prices*

**Waldorf Box Board Company, Midway, St. Paul, Minn.**







## The Only Knocker that makes a hit with everyone

No. 9242 Door Knocker  
Cast Bronze, Dull Brass  
Finish. Price each..... **80¢**

Rehm's New Catalog is ready for you. Write now; it's free. Shows fine big line of builders' hardware, tools, etc.

We do not sell to contractors in Cook County, Illinois.

No. 9242. 4 1/8 x 2 in.

**REHM HARDWARE CO.**

1503 Blue Island Ave. Chicago, Illinois

## Keen-Kutter-Quality

If the average mechanic were questioned as to the cost of his tools he would probably be able to remember what very few of them cost. He would, however, be absolutely sure as to their quality and as to the relative merits of the different makes of tools.

The Simmons Hardware Co., St. Louis, Mo., have long made a specialty of quality in their tools for carpenters and mechanics and every one of their tools carries their unqualified guarantee. Practically all hardware dealers carry a more or less complete line of Keen-Kutter tools, but those of our readers who have difficulty in securing them should write to the Simmons Hdw. Co., at their St. Louis office.

The Simmons Hdw. Co. have a handsome booklet of Home Furniture Designs, No. M 976.

## Reliable Hoists

Rapid construction can only take place when everyone, from the contractor to the lowest laborer, is sure that all of the machinery and apparatus about the building is in first-class condition and especially suited for the work which it is expected to do. No part of the work is more important than getting materials to the various floors but unless the hoisting apparatus is of such design that the men have perfect confidence in it there will be a great deal time wasted at both ends of the hoist. The Reliable Erie Hoist made by the Erie Clutch and Pulley Co., is made in a number of styles and sizes so that the contractor can secure just the one suited to his work. The catalog describing these machines can be obtained from the Erie Clutch and Pulley Co., 24th and Holland Sts., Erie, Pa.

## Contractors' Supplies

The contractor who keep his equipment in first-class condition is compelled to buy cordage, tackle blocks, waterproof covers and other supplies. Geo. B. Carpenter & Co., 202-208 Austin Ave., Chicago, Ill., have an exceptionally complete line of this class of material, from which they are able to ship promptly and on which they are prepared to make our readers the lowest prices. The catalog of Geo. B. Carpenter & Co. will be sent to those of our readers who especially request it.

Advertisers' Section



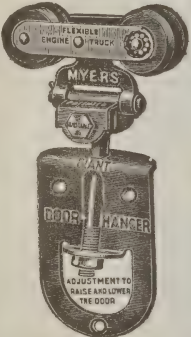
SUN-RED  
SELVAGE

## Rust-Proof Alumina

is a 10-coat electro-galvanized Window Screen Cloth—electrically applied after weaving. It is guaranteed to last from 2 to 5 times as long as any other Galvanized Cloth on the market.

We furnish Screen Makers and Mill people with free printed Folders for their trade. Write for free samples.

**Reynolds Wire Co. - Dixon, Illinois**



## MYERS GIANT

and New-Way  
Adjustable Tendem  
Door Hangers

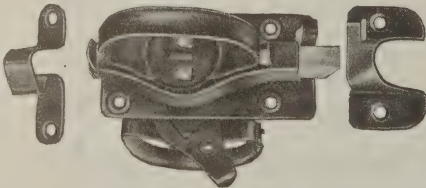
PATENTED

For Tubular Girder Track

Are adjustable up or down, and in or out. Trolley Wheels are heavy turned steel, revolving on steel roller bearings, and run inside the tubular girder track. Not affected by rain, sleet or ice. Write for descriptive circulars and prices.

**F. E. MYERS & BRO.**  
ASHLAND, OHIO

## Whitcomb Steel Barn Door Latch



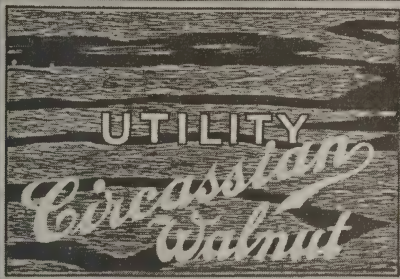
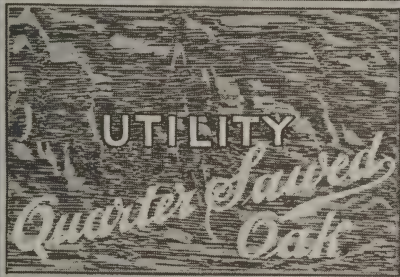
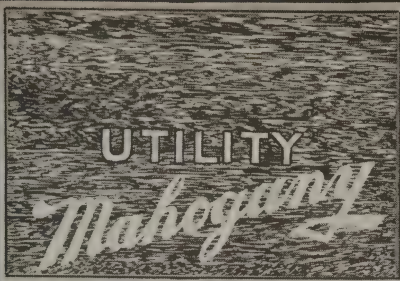
Over 13,000 Dozen Sold Last Year

A strong, durable, convenient latch, adjustable to doors of any thickness; will not catch barnness. Two large handles permit opening of doors from either side. Each latch provided with two catches to hold door open and closed. Also arranged for use of a padlock.

**Albany Hardware Mfg. Co., Albany, Wis.**



PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS



**Your Sample Panels of the new grained Utility Board are ready. Send for these today.**

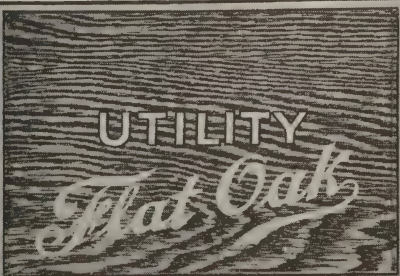
**Grained, not stained—the samples will show you the difference.**

*Write for them now*

### **The Heppes Company**

"Giant" Flex-A-Tile Shingles No-Tar Asphalt Paint  
Standard Flex-A-Tile Shingles Rubbertex Roll Roofing  
Other guaranteed Heppes products

**4502 Fillmore Street, Chicago, Illinois**



## **We Want a Man!**

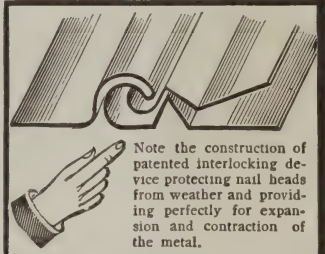
Our business is booming! We must have a good live agent in every community to demonstrate, take orders for and apply our Metal Spanish Tile Roofing. To the right kind of man we will pay a very liberal commission.

### **Build Yourself a Business**

Here is a chance to build up an independent, profitable business for yourself right at home. Many of our agents are now devoting their entire time to selling our metal roofing. Others have made big profits simply devoting part of their time to selling and laying our Metal Spanish Tile.

## **Edwards' Metal Spanish Tile**

Architects are specifying Edwards' Metal Spanish Tile, for they know it will do away with roofing "troubles." Builders like it because of the finished appearance it gives any house on which it is used.



Note the construction of patented interlocking device protecting nail heads from weather and providing perfectly for expansion and contraction of the metal.

### **Write For Territory**

It's going to be a case of "first come, first served" with favors to no special one. Right now the territory is being snapped up. Don't wait. One day's delay may mean that some one else will be given your territory. Don't delay; write today for new roofing catalog and special agent's proposition.

## **The Edwards Mfg. Co.**

*"The Sheet Metal Folks"*

**430-450 Eggleston Ave., Cincinnati, Ohio**

The World's Largest Metal Roofing, Metal Shingle and Metal Ceiling Manufacturers





### The Overland Delivery Car for the Contractor

One might just as well take a farmer to the Fat Stock Show and expect him to keep his eyes shut as to expect a contractor to turn these pages and not stop at this illustration of a brother contractor in his Willys-Overland Delivery Car. It is a scene of real interest portraying as it does the final work in construction, the rapid delivery of necessary materials and insuring the presence of the contractor or his superintendent on the job just when he is wanted.

The illustration is not an unusual one. Many contractors have jobs as big as this,

whereas without the car his time and energy would be largely wasted.

Appreciation of the contractor's problems has assisted Dept. 256 of the Willys-Overland Company to design a car especially suited to the contractor's business. The car, while not a truck, can carry a respectable load, about 800 pounds, besides two passengers. It will take quite a load of small stuff to weigh 800 pounds, and a car to carry much more would come in the truck class and would be more in demand among the larger building contractors. The



The Contractor Arrives On the Job for His Morning Inspection

frequently several at once in different sections of the town. Each has its stockhouse, piles of material, hoists, mixers, etc. Each may have a capable foreman and good workmen, but unless the superintendent gets around at frequent intervals there is sure to be time wasted, money lost and possibly mistakes made. The superintendent who keeps his eye on several jobs just *must* get around rapidly.

This contractor has seen the necessity for modern equipment about his office and his jobs. His work progresses rapidly because he is in a position to push it. A few minutes will take him to another job, perhaps,

above car is therefore ideal for the contractor doing a variety of work, as it combines utility with speed, and can be used for either.

Prosperity among the farmers has meant new buildings and improvements. Paying off the mortgage on the farm makes the farmer's wife demand a better house, either by building entirely new or fixing up the old house. How can the contractor go after this work unless he can get his men out to the farm quickly, take out nails and hardware and make frequent inspection trips as well? Many farmers dislike to board a miscellaneous lot of mechanics and

—we want every person who reads this paper to send for a sample of the new quartered oak finish Wall Board which we are making. It is the greatest thing you ever saw and when used in connection with the cream white finish it makes a wonderfully neat and attractive interior. We are making these finishes in both 32 inch and 48 inch widths and in all the regular lengths as formerly.

## NEPONSET Wall Board

is not only the most distinctive looking material but it is also the most *practical*, on account of the now famous waterproof surfaces.

Let us send you a sample of this quartered oak.



**BIRD & SON, Established 1795**  
EAST WALPOLE, MASS.

NEW YORK

CHICAGO

WASHINGTON

SAN FRANCISCO

Canadian Plant and Offices, Hamilton, Ontario

COUPON

**BIRD & SON,**  
Dept. N, East Walpole, Mass.

Please send us the sample of quartered oak finish NEPONSET Wall Board referred to in The National Builder.

Name \_\_\_\_\_

Address \_\_\_\_\_

Advertisers' Section .

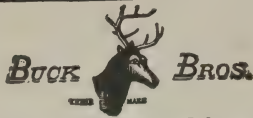
PUT THIS DOME ON  
LETTERS YOU WRITE  
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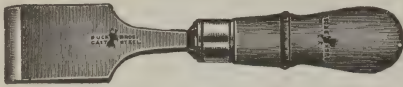


1853

1914



**61 Years of Tool Making Behind  
Buck Bros. Products**



Our line of tools includes Gouges, Plane Irons, Chisels, Drawing knives, Nail Sets, Screw Driver Bits, Carving Tools, etc. Our reputation guarantees them all. Catalog shows them all. Write for it.  
**BUCK BROS. : : MILLBURY, MASS.**

## GOODELL MITRE BOX

**Made of Steel ——— Cannot Break**



Send for New Circular E

**First in Quality  
& Improvements**

New STEEL BOTTOM PLATES with ANGULAR SERRATURES to prevent the work from slipping, and many other special features.

**GOODELL MFG. CO.,  
GREENFIELD . . MASSACHUSETTS**

**No Contract too Large  
for Capacity of**

## THE NORTHWESTERN TERRA COTTA CO.

**Nor too Small to Receive  
Proper Attention**

**Office and Works:  
2525 CLYBOURN AVE., CHICAGO, ILL.**

**Low Priced  
Labor Plus**

## Kees Metal Building Corners

**Equal Neat, High Quality Work**



Kees Metal Building Corners are ready to nail on and cheap labor can do the work as neatly as skilled. No delicate cutting and fitting of siding, no cutting of miters. Cheap in first cost, wear a lifetime, especially treated for painting, almost invisible after house is painted. By their use you save money and time, making your work neater and more durable and winning your customers' satisfaction.

**Write today for free samples, prices  
and profit-making particulars**

**F.D. KEES MFG. CO. BEATRICE, NEB.**  
Box 811

laborers, and the mechanics and laborers themselves like to get home every night, too. With a car of this character the contractor can take his men half a dozen or more miles every morning and go after them at night, thus pleasing everybody with the least effort on the part of everyone.

Each contractor has his own problems, differing somewhat, but the transportation problem is of first importance. Many of our readers have solved it via the Overland Car and Dept. 256 of the Willys-Overland Co. will assist others in solving the same questions.

We haven't said much about the construction of the Willys-Overland Delivery Car, because it would take many pages. A special catalog describes the car in detail, shows it in use and on the job and gives information along the lines which every contractor desires to be posted on. The catalog is, of course, sent free to our readers on application to Department 256, of the Willys-Overland Co., at Toledo, O.

## Water-Proof Cellars

The fact that a great many cellars are not waterproof has led many people to believe that it was impossible to prevent the walls and floors from being wet or damp most of the time. That this is not true is indicated by the literature which the Bitu-Mortar Waterproofing Co., 340-342 E. 27th St., New York, N. Y., are sending to our readers on request. Bitu-Mortar waterproofing makes the cellar permanently water-tight by the application of a one-inch finish of portland cement to which Bitu-Waterproofing compound has been added. The Bitu-Mortar Waterproofing Co. will be glad to advise our readers on the waterproofing of any buildings or places and to send the fullest information regarding their products.

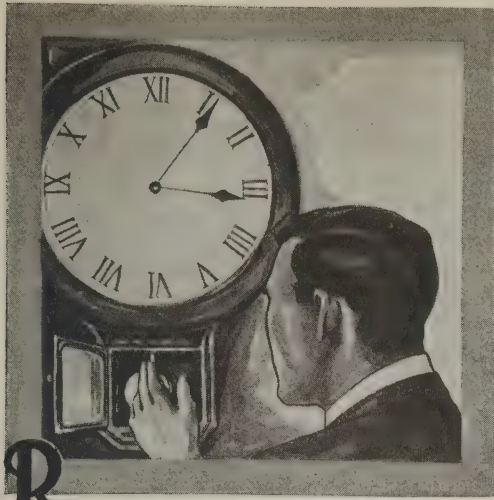
## Stopping the Leaks

Every contractor has at times been called to stop leaks around window skylights, chimneys and other places about the roof. Sometimes this is easily done provided he can find just where the leak occurs. Many times, however, the entire roof has been laid in such a way that it requires careful scrutiny in order to determine just where the water enters. The roofer who has been careful to use Hetzel's Elastic Rubber Roof



**PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS**

Advertisers' Section



## Buying Cheap Roofing to save money is like stopping the clock to save time—

You builders and contractors—you know that the homes you build are the lasting monuments of your reputation, and if they don't last they are monuments of your inefficiency.

That is why you can't afford to use anything but the best roofing—a roofing that will stand up under the ravages of weather and time, that will retain its beauty permanently. The one roofing that best answers these requirements is

## Flex-A-Tile Asphalt Shingles

Flex-A-Tiles have been tested in all sorts of climates and in all sorts of service. They are made right and look right. If you want to put handsome roofs on the next homes you build, a roof that will grow more beautiful with the passing of years, use Flex-A-Tiles; and Flex-A-Tiles are so beautiful and satisfying it is easy to get more for your house from the consumer.

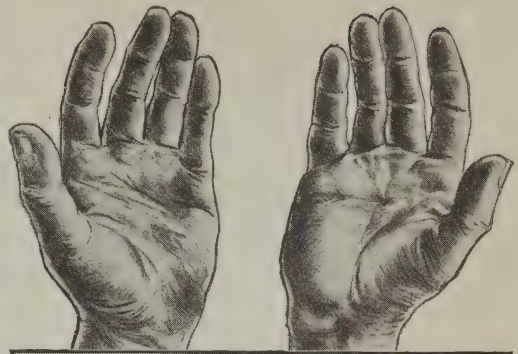
### Send for this Free Book, "Flex-A-Tile Homes"

This book shows actual roofs. It will be a big help to you in soliciting business—in showing your customers what their roofs will look like. Send for it now. It is yours, together with samples of Flex-A-Tiles, free.

## The Heppes Company

Utility Wall Board No-Tar Asphalt Paint  
Flex-A-Tile "Giant" Shingles Rubbertex Roll Roofing  
Other Guaranteed Heppes Products

1012 So. Kilbourne Ave., Chicago, Ill.



## Your Hands Can't Earn the Money You Need

You'll have to work for low wages all your life if you depend upon your hands to make your living.

To earn more money you must have the *special training* that will enable you to get and hold a better job.

The International Correspondence Schools will give you this necessary training in your own home, in your spare time. They will fit you for a *better position*, where you can earn more money.

If you want to advance in your present occupation, the I. C. S. will give you the *training* that will entitle you to promotion. If your present work is not congenial, the I. C. S. will qualify you for a good position in the kind of work that you like.

### Mark the Coupon

What occupation attracts you or what position do you want? Mark it and mail the coupon now, and learn how the I. C. S. can help *you* to earn the money you need.

## INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 1332-F, SCRANTON, PA.

Please explain, without obligation on my part, how I can qualify for the position before which I mark X.

- |   |  |
|---|--|
| <input type="checkbox"/> Architecture             | <input type="checkbox"/> Plumbing Inspector      |
| <input type="checkbox"/> Architectural Draftsman  | <input type="checkbox"/> Mechanical Engineer     |
| <input type="checkbox"/> Contracting & Building   | <input type="checkbox"/> Patternmaking           |
| <input type="checkbox"/> Building Foreman         | <input type="checkbox"/> Civil Engineer          |
| <input type="checkbox"/> Structural Engineer      | <input type="checkbox"/> Surveying and Mapping   |
| <input type="checkbox"/> Structural Draftsman     | <input type="checkbox"/> Commercial Illustrating |
| <input type="checkbox"/> Concrete Construction    | <input type="checkbox"/> Mining Engineer         |
| <input type="checkbox"/> Law for Contractors      | <input type="checkbox"/> Automobile Running      |
| <input type="checkbox"/> Estimating Clerk         | <input type="checkbox"/> Motor Boat Running      |
| <input type="checkbox"/> Electrical Engineer      | <input type="checkbox"/> Bookkeeper              |
| <input type="checkbox"/> Electric Lighting        | <input type="checkbox"/> Stenographer            |
| <input type="checkbox"/> Plumbing & Steam Fitting | <input type="checkbox"/> Civil Service Exams.    |
| <input type="checkbox"/> Heating and Ventilation  | <input type="checkbox"/> Advertising Man         |

Name

St. and No.

City  State

Present Occupation

Advertisers' Section

PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS





Cement need have no fear that leaks will occur from any ordinary cause and the contractor who has used this material around windows, skylights, chimneys, etc., will be practically sure against any trouble occurring at those places.

A sample of Hetzel's Elastic Rubber Roof Cement, together with prices and booklet, can be obtained from the estate of J. G. Hetzel, 63 Maine St., Newark, N. J., and this will allow the contractor to determine its merits and its possibilities in his work.

### **Moving Buildings**

Under ordinary circumstances a building is constructed to remain in its original location. There are times, however, when it is advisable to move a building from one place to another and at such times the building requires very careful handling in order not to rack it to pieces and cause the repairs to amount to more than the value of the building.

The apparatus designed by the La Plant-Choate Mfg. Co., 614 Eastlack Court, Cedar Rapids, Ia., enables the contractor to move a building in perfect safety and with great rapidity. An instance is given where a contractor moved a ten room house five miles in ten days, by the use of this apparatus. Their catalog R issued by the above company describes this apparatus in detail as well as gives the contractor a great deal of valuable information on the subject of moving buildings of every character.

### **This Is Screen Time**

About this time of the year, in the North especially, everyone is busy getting out their last year's screens and considering the damage which must be repaired before they are in a serviceable condition. The contractor who makes a study of seasonable occupations is ready to do this class of work and is therefore able to pick up many jobs of which he would otherwise hear nothing and which in many cases would be done by the owner himself.

Mr. J. F. Schafer, Mount Pulaski, Ill., has designed a machine for stretching wire cloth on both new and old frames. This machine will save the contractor a great deal of time and labor in doing screen work and will make that class of work both pleasant and remunerative. Further particulars

about this machine as well as prices, etc., can be obtained from Mr. Schafer direct.

### **Easily Operated Concrete Mixers**

Some concrete mixers seem to be especially adapted for making trouble. Every little while something breaks or bends or gives away or else refuses to work at all. This means more than the actual loss to the mixer, as it means time lost by the whole gang who are waiting for the machine's recovery.

The Ideal Cincinnati Batch Mixer made by the Ideal Concrete Machinery Co., 1312 Monmouth Ave., Cincinnati, O., are designed to be trouble proof under the most adverse circumstances. These mixers will keep the crew jumping from morning to night and will mean a steady return in profits to the contractor. These mixers are made in a great variety of styles and sizes adapted to various purposes and all of these styles and sizes are shown in detail in the literature which the Ideal Concrete Machinery Co. are glad to send to our readers on request.

### **Medicine Cabinets for Every Home**

Every home should have on hand ready for emergencies a number of first aid remedies. It is not sufficient to merely have these, they must be kept where every one knows their location and the most satisfactory method of doing this is by the use of a medicine cabinet. These are made in a number of styles and sizes, for building in new buildings and as well as adding to old ones.

The Stork Millwork Co., 20 West Jackson St., Chicago, Ill., have a catalog showing a variety of styles and sizes, together with prices, etc. This catalog will be sent to our readers on request and they will then be able to order such cabinets as they need for the work which they have under construction or in contemplation.

A building contract was not fully performed, where the contractor failed to comply with the requirements of the contract in at least fourteen particulars, for which the master found that the other party was entitled to \$338.44, in the way of recoupment.—*Hennessey v. Preston*, 106 N. E. (Ind.) 570.



## *The Test of Time is a Proof of Quality—*

A good shingle roof is possible only when the shingles will stay in place. You can give better satisfaction on shingling jobs by using Zinc-Clads—the rustless, wear-resisting shingle nails.

Your customers expect satisfactory work from you. It is a credit to you as a builder to give them satisfaction.

To serve your own best interests, as well as those of your customers, specify and use **Zinc-Clad Shingle Nails**. They are coated with molten zinc by the hot process. Guaranteed non-rusting; packed in sanitary 5-pound cartons

**Get Zinc Clads From Your Dealer**  
**PRICE 8c PER POUND**

Your hardware dealer or lumber dealer can furnish you with Zinc-Clads. If you can't get them in your town, send your order direct to us. We will fill it at the advertised price per pound. Order Zinc-Clads today.

### **W. H. Maze Company**

**Address Dept. N, PERU, ILL.**

Sole Manufacturers of the Zinc City (Pure Zinc) Shingle Nails



Advertisers' Section

PUT THIS DOME ON  
LETTERS YOU WRITE  
ADVERTISERS. IT HELPS

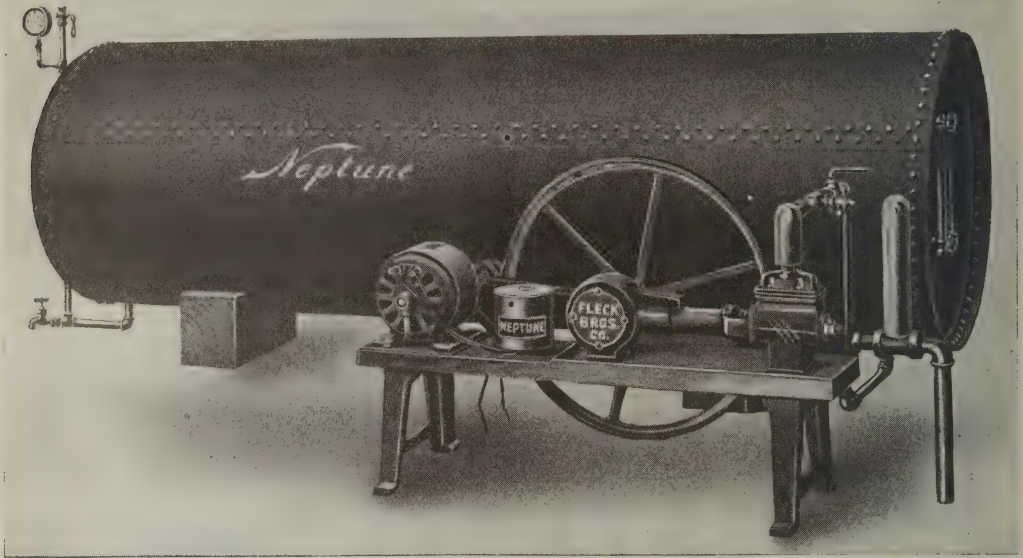




### Satisfactory Tank Systems

The average home owner knows very little about modern methods of construction, modern materials, and modern equipment. In fact a great many contractors do not

matic water supply systems, by which a large house or isolated building can maintain a high pressure for fire protection or other purposes. One such system shown



The Neptune Pneumatic Pressure Tank

keep up with what is new in this line. Since the advent of the automobile, it has been necessary in many cases to store supplies of gasoline, and unless this is practically done there is great danger of fire and other damage.

There is also a growing demand for pneu-

above, made by the Fleck Bros. Co., 52 No. 5th St., Philadelphia, Pa., is exceptionally satisfactory for this purpose. The Fleck Bros. Co., advise us that their complete catalog will be of great interest to contractors who are installing tanks of any character.

### A Supplement Catalog of Plumbing Goods

The John Hardin Company's new enamel ware supplement catalog on high class bath tubs, lavatories, closet outfits, drinking fountains, kitchen sinks, enamel laundry trays, etc., is a splendid book for contractors and builders to specify and buy from. This new supplement catalog shows a class of fine plumbing goods in such an attractive way that no architect, contractor or builder need be ashamed to let the most exacting home owner look it over and know where his plumbing is coming from.

The John Hardin Co. has for many years been selling high class plumbing goods direct to builders and at prices which are said to be exceedingly low for the quality and

workmanship given. Their catalogs and goods have always been in demand, but it is safe to say that their new enamel ware supplement will be especially well liked. This is because of the growing demand for the very best that can be had in bath tubs, lavatories, kitchen sinks, laundry trays, etc., and because this enamel ware catalog is just what a lot of builders have been looking for. The styles or designs shown are so attractive that it ought to make it easy for any contractor or builder to get the owner to pay for something he will always be especially proud of and which will be substantial, as well as attractive.

The accompanying illustration shows a

# Here It Is!

## Hicks' Estimating Data Blanks

By I. P. Hicks

Estimating is the basis of contracting. Unless your figures are right, you lose even the chance to show your worth.

Hicks' Estimating Data Blanks provide a practical method of listing materials, and pricing them. They will help you to avoid errors and omissions. You can use the estimate to order material from, after you get the contract.

To make money, not only must you get the contract, but you must get it at a price sufficient to show a profit. Let the other fellow take the unprofitable jobs. It will leave the good ones for you.

Each book of blanks contains space for six complete estimates. Try them and you will always use them.

**Price Per Book, 50c, Postpaid**

**The National Builder**  
537 S. Dearborn St., Chicago, Ill.

## What you want to Know about Paint



### Tinting Colors

In choosing a color scheme for a house, consider permanency of colors as well as their harmony and appearance when fresh.

In the Carter Master Painter's Color Pack are shown 53 different colors, shades and tints, selected especially with reference to outside painting. All are made with Carter White Lead and the following tinting colors ground in oil:

Permanent		Fairly Permanent
Lamp Black	Burnt Umber	Prussian Blue
French Ochre	Burnt Sienna	Med. Chrome Yellow
Venetian Red	Raw Sienna	Med. Chrome Green
Raw Umber	Tuscan Red	

The first eight are all thoroughly permanent and are not subject to change under ordinary atmospheric conditions.

Prussian Blue will fade in bright sunlight, but for porch ceilings and other shaded places, it is entirely satisfactory.

The Chrome Yellows cannot be dispensed with, for there is nothing else more permanent which will produce such bright, lively tints. They are generally satisfactory except when used on plaster or concrete which has not lost all the caustic properties of the lime used in it.

The Chrome Greens cannot be spared either, although they are likely to fade somewhat on exposure.

Light, conservative tints and shades usually do not fade as soon as bright strong colors. One does not tire of them as soon and they show better taste.

Colored paints are clear and delicate exactly in proportion to the whiteness of the white lead from which they are made. By having Carter Lead used you not only get *white* white jobs but also wonderfully soft, clear tints.

The Paint Information Bureau

**Carter White Lead Co.**  
West Pullman Station "B" Chicago, Ill.





design taken from this supplement catalog. It is Hardin's No. 815 Colonial Pedestal Lavatory, made of high grade porcelain enamel, and pedestal with concealed integral overflow. It has heavy Fuller faucets; nickel-plated concealed supplies and 1¼-inch heavy pattern adjustable nickel plated



A Modern Lavatory

brass trap to the floor or wall. Other designs equally as attractive are shown.

The John Hardin Co., 47th and Cottage Grove Ave., Chicago, will mail this supplement catalog and prices to those who have plumbing jobs on hand.

#### Four New Jobs

"What kind of a shingle is that, something new, isn't it?"

"Looks like it would stand lots of wear—it's certainly thick and tough enough—good looking, too?"

These are typical of the comments that were made by visitors to a Wisconsin contractor's office after he tried the experiment of laying samples of asphalt shingles on his plan table.

This experiment was suggested to him by the Heppes Company of Chicago who are furnishing free to contractors, carpenters and builders complete displays of their Flex-A-Tile "Giant" Asphalt Shingles, as well as their "Standard" Flex-A-

Tiles, their Dreadnaught and Flex-A-Tile Roll Roofing, their Utility Board in grained wood finishes and their other guaranteed asphalt products.

In a recent letter to the Heppes Company, this Wisconsin contractor says that his display of asphalt shingles in his office, coupled with the fact that he had laid several roofs with Flex-A-Tile Giants to which he could point as visible evidence of his workmanship, opened the way for four new jobs.

Readers of this magazine can get in touch with the Heppes Company by writing their factory, 1012 So. Kilbourne Ave., Chicago, and secure samples for display without cost.

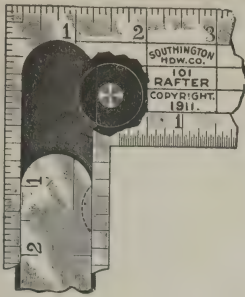
The rich-looking texture of the Heppes Company's Flex-A-Tile "Giant" Asphalt Shingles as well as of their Utility Board in grained wood finishes—"not stained but grained"—makes new customers for contractors who feature them.

#### The Uniform Saw Set

Just as soon as a saw is used it begins to lose its set. The better the saw the longer it will be before it must be set again, but it is one of the unavoidable things in carpentry. The carpenter must, therefore, have a suitable saw set ready for use when his tools require it. Mr. J. O. Petty, Belvidere, Ill., has designed a saw set which possesses unusual advantages. The set is so arranged that it can be worked by a foot tread, thus leaving both hands free to hold the saw in position. It is also adjustable in several ways so as to give exactly the set required. A peculiar feature of this set is that every tooth is given just exactly the same set. Mr. Petty will be glad to send a descriptive circular of this set to those of our readers who are interested enough to ask him for it.

#### The Schilli Screen Stretcher

The M. L. Schilli Mfg. Co., Pierron, Ill., have placed on the market a screen stretcher which they claim does the work in one-fourth of the usual time. It is said by the use of this stretcher the wire is kept taut and at a uniform tension, thus cutting down labor cost and making every job show a profit as well as giving greater satisfaction to the customer. An interesting description of this stretcher as well as prices, etc., can be obtained from the company at the above address.



Write us for prices on our new "Hold Fast" Bevel

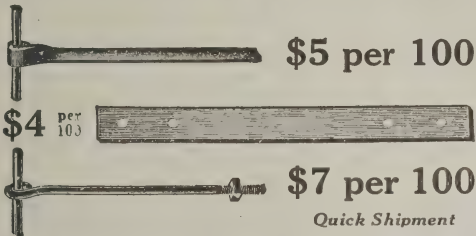
## This is the Celebrated "Standard" Take Down Square

**NOTE THE LOCKING DEVICE---CANNOT SLIP**

Prices—Rustless Blue; Copper or Nickle Plate; Rustless Galvanized, which is a new one—\$2.50 each, delivered to you.

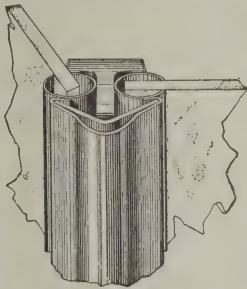
**THE SOUTHINGTON HARDWARE COMPANY**  
Southington, Connecticut

## STANDARD BUILDING ANCHORS



Chas. Mulvey Mfg. Co., 1541 W. 35th St., Chicago, Ill.

## The Voltz Universal Sash Bar

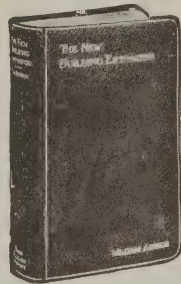


A strong, rigid, practical bar—makes any angle without cutting or fitting—a real bar and no toy.

"Holds with the grip of iron, yet with the touch of velvet."

Write for catalogue and prices

**VOLTZ MFG. CO.**  
914-18 Penn St.  
St. Joseph, Missouri



## For Your Protection!

As a guard against mistakes that may result in heavy loss—you owe it to yourself to procure a copy of "The New Building Estimator" by William Arthur.

It's a book for practical men written by a practical man—a book that contains just what you want to know, arranged in the most convenient way.

744 Pages. Bound in Flexible Leather  
Price \$3.00 Postpaid

**PORTER-HODGSON COMPANY**  
537 So. Dearborn St. Chicago, Illinois

## Diamond Expansion Bolts

For fastening all kinds of material to brick, stone or concrete—

**Quickly  
Securely  
Positively**



**"They Hold as Long  
as the Wall Lasts."**

**Diamond Expansion Bolt Co.**  
90 West Street - New York



### Fibro-Wallboard

The Waldorf Box Board Co., Midway, St. Paul, Minn., are sending to our readers who so request, beautiful samples of their decorated-ready-to-apply Wall Board. These samples are among the valuable items which should be found in the office of every contractor, as they will enable the contractor to show his clients just what kind of a finish he can give them.

Besides the Wall Board painted and decorated as above mentioned, the Waldorf Box Board Company make an artistic Oak Grain Board, in which the grain color and general appearance of the finest oak is faithfully reproduced. This will enable the contractor to finish numerous rooms appropriately and at moderate cost.

How much interest is being taken in Wall Board is indicated by the numerous quantities sold by this and other companies. This company alone has sold many millions of feet, and the increase in their business indicates that they are producing a material of merit which gives



satisfaction and calls for repeat orders. Their catalog gives prices, etc.

### Hay Tools and Barn Equipment

Some say it takes two to make a bargain or pick a quarrel, and that is only another way of saying that conditions must be right before anything can start. It takes coal and water in the locomotive and in just the right condition before the engineer can even blow the whistle.

Just so, the farmer's barn must be complete before he can really enjoy it. What's the use of modern fixtures without a roof over them? Might just as well hitch the cattle to the fence posts. What's the use of a fine hay mow without suitable means of filling it?

The Stickler Hay Tool Co., Janesville, Wis., show in their catalog barn equipment designed for various styles of barns, and such that any contractor can put it up without difficulty. The catalog lists the various pieces necessary to equip barns of various lengths, thus giving the contractor information not generally found in catalogs.


Patented December 29, 1914


## TYSCRU

TRADE MARK

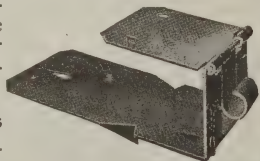
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Makes correct wall measurements **certain**; easily fastened; holds fast; the **one** bolt anchorage that distributes the strain; saves time and labor; eliminates with sets of twisted wire and bracing; made in all sizes. Write for prices and discount sheet X.

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and a piece of 2x4 scantling make the *safest* support possible. Can be placed in position between the shingles in a few seconds; four sharp lugs hold them in tight. No nails to drive, no damage to shingles or roof. Made of sheet metal. Save time, labor and nails. Write for special offer to agents. Price \$3.00 per dozen. Order now. Satisfaction guaranteed.



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Royal Ventilator Company, 410 Locust Street, Philadelphia, Pa.

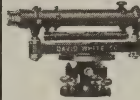


## ELEVATORS

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State your requirements. Our reasonable price will interest you.

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## WHITE'S IMPROVED LEVEL

This is an accurate and inexpensive instrument, especially designed for work where a general-purpose level is required. *Telescope is 12' long, with magnifying power 25 diameters and will detect an error of 1-16 inch*

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David White Co., Inc., 420 E. Water St., Milwaukee, Wis.

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Proved by Use—  
Unexcelled for windows without pocket frames. Excellent for new windows.



Send for circular and prices, or \$1.00 for trial set prepaid; state approximate weight of sash.

**AUTOMATIC SASH HOLDER MFG. CO., 48 Church St., New York.**

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The lately patented springs and corrugated steel rods put the "Phoenix" far in lead of less improved styles.

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## JOHNSTON'S Patent SHELF PIN

*These Pins are used for supporting movable shelves in Book Cases. Cannot fall out or sag down. The best shelf pin made. Easily put in place by any one.*

Send for free sample to **J.D. JOHNSTON, NEWPORT, R. I.**

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One set of complete blue prints for any 8 room frame residence in accordance with your ideas.

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The Bungalow Specialists, 2148 So. Kedzie Ave., Chicago

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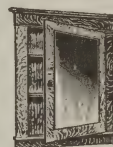
A well established law office, including books, office furniture, good-will, present cases, etc., in a progressive city of 7,000, can be bought at a very reasonable figure. This offers a most attractive opportunity for a young man, as the purchaser will have the benefit of the wide acquaintance, advice and assistance of the present owner. For full particulars, address

**M. A. C., Care of The National Builder, Chicago Illinois**

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Beautiful Medicine Cases with genuine bevel plate mirror; shelves all complete; Yellow Pine. **\$3.75 3 Cabinets Complete, \$10.50.** Medicine Cabinets made to hang against wall. Complete with bevel plate mirror. Yellow Pine, varnished, **\$3.50**

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We furnish all styles and sizes, from a house dumbwaiter to a 40,000-pound electric elevator. Write for catalog.

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White Porcelain, Enameled, Good Quality

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18x24, drainboard 18x24 Complete as Shown **\$10.45**

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CHAS. P. KULP & CO., 1611 S. State St., Chicago

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## SELF-SETTING PLANE

Sample sent as per circular if not kept by dealers.

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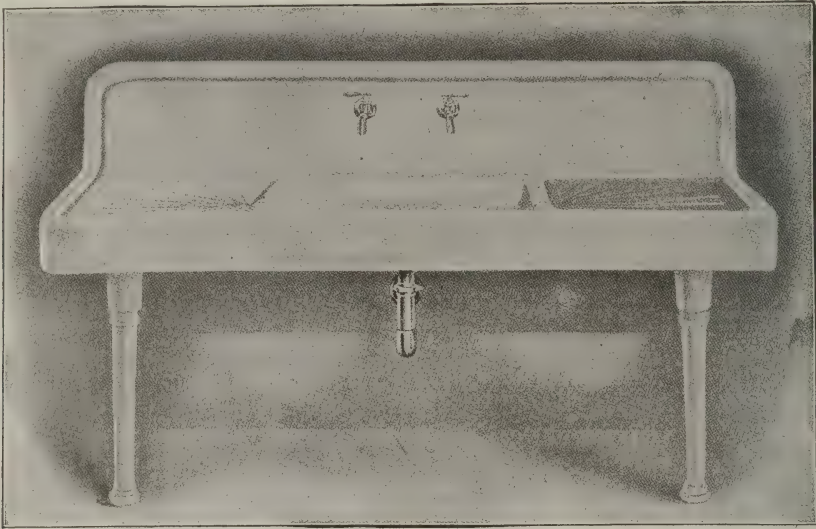


### A Modern Kitchen Sink

Every housewife appreciates a nice kitchen sink, and the one shown herewith will be sure to please every one of them. This is an illustration from the latest catalog of Chas. P. Kulp & Co., 1611 So. State

quired, and this takes time by the ordinary methods.

The Kwik-Kut Asbestos Shingle Cutter made by the Gundlach Machine Co., Belleville, Ill., is designed to cut, trim and punch asbestos shingles with both speed and ac-



A One-Piece Porcelain Enameled Sink

St., Chicago, Ill. The catalog which is sent free to our readers contains descriptions, photos, prices of not only single pieces like the sink illustrated, but also of numerous bathroom combinations of all the fixtures complete.

### The Kwik-Kut Asbestos Shingle Cutter

The large percentage of fires which originate in the roof from outside fires, would almost justify the use of incombustible roofing material. Add to this the good appearance and permanency of asbestos shingles, and one readily sees why this kind of roofing is increasing in popularity.

But, however, good a roofing material is unless it can be cut and trimmed and fitted to place, it is of questionable value for places where much cutting is required such as on residences where there are many hips, valleys, gables, chimneys, etc., to be cut and laid around.

Wherever cutting is required, the work progresses slowly as the pieces must be measured for, cut, tried and fitted. Unless one is an expert, two or more cuts are re-

quired. The device is portable and can be carried to the place where the shingle is to be laid, thus saving a great deal of time. The Gundlach Machine Co. have a booklet showing the machine in operation as well as samples of the cuts possible. The booklet will be sent to our readers on request and will perhaps be the means of starting them in the Asbestos Shingle business, as it shows so plainly the possibilities of roofing of this character.

### Building Conditions in April

While there was a slight decrease in building operations in the leading cities of the United States for April, the showing is very satisfactory in comparison with the corresponding month a year ago, when the entire situation is taken into consideration. Permits were taken out in April in one hundred cities for the construction of 27,408 buildings, involving a total estimated cost of \$70,256,120, against 27,790 buildings, aggregating in cost \$74,712,981 for the same month a year ago, a decrease of 382 buildings and \$4,456,861, or 6 per cent. Of the

total number there were increases in 39 and decreases in 60 cities. The figures in detail are as follows:

Cities	1915		1914	
	No. of Bldgs.	Estimated Cost	No. of Bldgs.	Estimated Cost
New York (Boros of Man. and Bronx)	833	\$ 9,977,610	983	\$ 7,385,205
Chicago	754	6,820,700	1,099	9,465,400
Brooklyn	1,479	5,284,658	1,265	5,230,120
Boston	553	5,257,000	546	5,471,000
Detroit	958	4,268,460	1,079	3,013,725
Cleveland	1,897	3,076,385	1,568	2,594,115
Minneapolis	949	1,951,035	890	1,912,290
San Francisco	553	1,646,374	552	1,707,604
Los Angeles	721	1,591,399	1,013	1,898,304
Bridgeport	1,007	1,493,413	105	210,905
Cincinnati	1,658	1,317,485	1,506	964,423
Buffalo	543	1,190,000	462	1,280,000
Milwaukee	600	1,173,658	554	1,343,502
Rochester	439	1,159,257	453	1,156,109
Kansas City, Mo.	488	1,125,170	354	736,665
Washington, D. C.	505	1,029,020	488	851,309
St. Louis	981	986,719	1,090	1,734,412
Pittsburgh	453	974,283	390	1,158,225
Toledo	392	959,042	338	772,144
Seattle	822	837,105	936	1,227,930
St. Paul	339	829,914	269	1,204,759
Indianapolis	701	776,511	764	1,037,466
Hartford	153	582,602	112	453,843
Portland, Ore.	477	559,415	605	769,500
Newark	250	549,846	234	754,142
Worcester	207	542,860	196	485,174
Oakland	294	530,302	300	405,540
Dallas	111	492,175	193	565,335
New Haven	163	465,320	116	249,485
Atlanta	240	446,337	335	565,879
Memphis	222	438,355	288	420,085
New Bedford	144	434,520	141	392,150
Columbus	310	406,555	375	683,555
Omaha	157	389,420	154	593,035
Baltimore	248	388,213	412	635,215
Akron	260	381,035	319	659,030
E. St. Louis, Ill.	55	378,280	57	78,745
Richmond	148	370,114	142	557,131
Springfield, Mass.	167	365,475	169	450,460
Duluth	234	340,178	210	440,491
New Orleans	...	339,571	...	218,350
Denver	389	326,590	454	225,405
Peoria	60	317,305	54	179,650
Grand Rapids	281	298,394	175	132,184
Albany	383	285,745	450	1,156,595
Louisville	355	282,400	333	447,870
Salt Lake City	150	252,852	119	321,200
Des Moines	78	225,223	84	181,178
Youngstown	154	219,505	160	470,035
Trenton	156	219,000	145	232,602
Canton	97	217,520	56	107,100
Erie, Pa.	204	213,918	252	399,183
Dayton	119	210,260	142	421,300
Sioux City	72	201,670	118	317,837
Lincoln, Neb.	88	195,999	71	172,540
Binghamton	314	180,335	236	567,029
Portland, Me.	67	177,734	40	85,000
Birmingham	300	169,701	344	318,144
Norfolk, Va.	56	163,218	95	312,630
Quincy, Mass.	110	154,725	84	153,511
Kansas City, Kas.	99	147,560	86	113,995
Allentown	...	146,295	...	466,270
Elizabeth	46	141,575	58	193,774
Savannah	56	139,585	47	58,830
San Antonio	147	131,955	236	324,760
St. Joseph, Mo.	106	130,320	87	74,820
Berkeley	91	129,000	118	303,950
Spokane	119	126,875	96	214,610
Paterson	131	124,426	118	293,458
Wilmington	...	124,020	...	286,050
Wilkes-Barre	215	119,746	85	86,195
Scranton	100	118,952	84	157,333
Springfield, Ill.	45	115,115	56	79,015
Haverhill	56	114,200	26	113,350
Reading	55	111,375	63	87,200
Topeka	71	108,875	44	69,875
Altoona	174	108,570	118	130,107
Davenport	64	108,022	116	256,998
Tampa	129	106,665	152	125,280
South Bend	69	103,129	80	158,105
San Jose	40	103,077	54	83,094
Schenectady	100	101,748	105	206,953
Lawrence	36	98,325	39	190,960
Pasadena	122	96,923	145	156,455
Superior	132	95,455	70	67,514
San Diego	122	95,350	203	240,805
Fort Worth	58	81,495	72	214,050
Passaic	29	81,099	65	239,982
Brooklyn	69	80,803	69	71,797
Nashville	367	70,078	101	258,505
Saginaw	54	69,816	64	93,585

Woonsocket	46	69,060	25	40,540
Troy	84	60,745	59	37,333
Sacramento	94	58,591	114	207,345
Tacoma	107	47,889	147	105,303
Chattanooga	162	44,295	207	219,490
Stockton	51	38,502	42	58,742
Auburn	...	35,295	...	26,200
Holyoke	25	21,395	31	554,137
Colorado Springs	31	12,045	34	60,000

27,408 \$70,256,120 27,790 \$74,712,981

"Spotted" describes the condition throughout the country most accurately. New York and New England, as well as the Central lake states, reflecting the greatest activity, and even in these sections there were some heavy losses. There were heavy losses in the Pacific Coast cities with the exception of two or three small places. A gratifying feature is an increase of 35 per cent in New York City, indicating most satisfactory improvement in comparison with the recent past. The effect of labor troubles in Chicago are clearly discernible in a decrease of 28 per cent—almost remarkable when taken in comparison with former conditions, building having been continuously active in the latter city notwithstanding the situation abroad. Brooklyn had a gain of 1 and Boston a loss of 4 per cent, St. Louis suffering a somewhat severe loss of 43 per cent. There were increases in Detroit 42 per cent, Cleveland 19, Minneapolis 2, Bridgeport 608, Cincinnati 37, Kansas City 53, Washington 21, Toledo 24, Hartford 28, New Haven 86, Newark 27, Worcester 12, Oakland 31, Memphis 4, New Bedford 11, East St. Louis 380, New Orleans 65, Denver 45, Peoria 77, Grand Rapids 126, Des Moines 24, Canton, O., 103, Lincoln 14, Portland, Me., 109, Kansas City, Kan., 29, Savannah 127, St. Joseph, Mo., 74, Wilkes Barre, 39, Springfield, Ill., 46, Reading 28, Topeka 56, San Jose 24, Superior 41, Brockton, 13, Woonsocket 70, Troy 63, Auburn 35.

### The Wolverine Indoor Closet

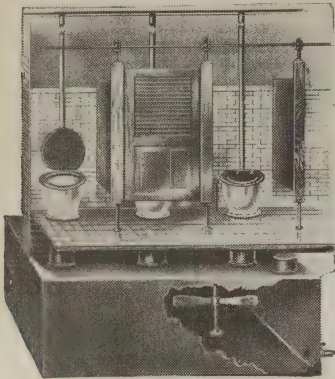
Everyone realizes that improved sanitary conveniences are a necessity on the farm and in the small town, just as much as in the large city. With the growth of the small place the necessity becomes more and more apparent, and the education of the people to the fact that suitable means are at hand is largely up to the contractors and builders.

The Dail Steel Products Co., 835 East Main St., Lansing, Mich., has seen the demand coming for a satisfactory indoor closet, and they have designed their "Wol-



verine" closet to meet the demands of the investigating public.

The Wolverine Indoor Closet can be installed in any house or building, either new



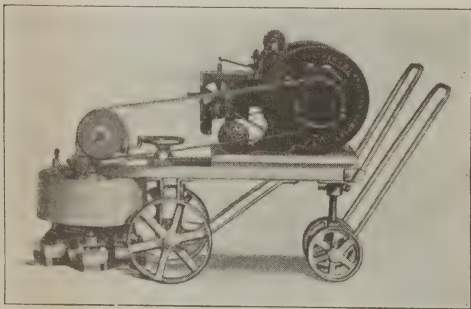
A Multiple Closet Installation

or old, and takes the place of a water closet where a water system is not possible. The first cost is very much less, and the cost of maintenance is practically nothing.

The Dail Steel Products Co., is handling their proposition largely through contractors and builders, and they advise us that they still have a number of desirable territories in which they wish to place agents. This is an excellent opportunity for some of our readers to get into a paying business and we believe that they will take advantage of it.

### The Northern Floor Surfacers

Terrazzo, Tile, Marble, Concrete and even wood floors must be brought to a



A Power Floor Surfacers

level surface and polished before they are accepted by the modern home owner. Of course this can be done by hand, but the modern way is to use a machine, such as

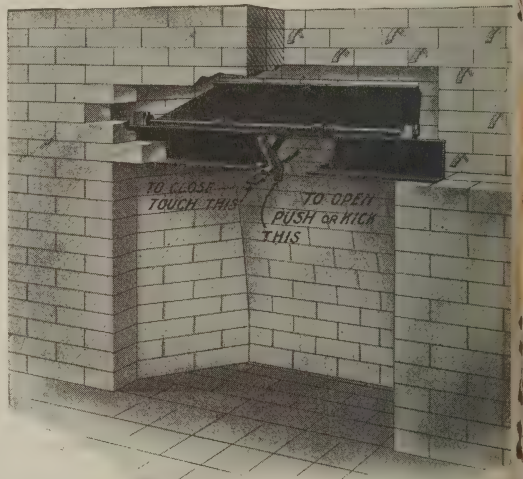
the one shown here, made by the Chicago Builders' Specialty Co., 1412 Builders Exchange Building, corner LaSalle and Madison Sts., Chicago, Ill.

This machine will surface large areas at less than one-fourth the cost of hand surfacing. The item of time must also be considered.

The catalog of the Builders' Specialty Co. contains a number of other specialties of interest to the contractor. It will be sent to our readers on request.

### The Colonial Simplex Fireplace Damper

Before the general use of gas and electricity it was understood that a chimney was an essential part of a house. Ever so many builders failed to realize the scientific



The Colonial Fireplace Damper

reasons for careful construction of the chimney and especially of the fireplace.

The Colonial Fireplace Co., 4611 West 12th St., Chicago, Ill., after a careful study of conditions, designed the Simplex Damper, which controls the fire in a most scientific manner. The cut indicates the general design of the damper and its ease of installation and operation.

The Simplex Damper is made in a number of styles and sizes to suit practically every condition and our readers can obtain a list of these styles and sizes from the manufacturers at the above address.



















